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ORAL HEALTH

VOLUME V.

1915

32
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223

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Published by

ORAL HEALTH PUBLISHING CO.,

Toronto, Canada.

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Soldiers' Teeth

A RECRUIT who was rejected for defective teeth complained bitterly, saying that he did not want to bite the Germans, he wanted to shoot them.

No doubt the condition of the teeth is very important, not because Germans are to be bitten, but because good digestion depends upon good mastication.

But why reject a recruit for defective teeth, if the defect is curable? Why not have a staff of dentists at the recruiting camp and have every soldier's teeth put in first-class condition at the country's expense.

The thing need not be done extravagantly. Some of the "frills" could be omitted, and no work done that is not absolutely necessary. It seems foolish to send away any man who has a curable disease, whether in the mouth or anywhere else. Take him and cure him.—Toronto Daily Star.



MAJOR-GENERAL LESSARD

Inspector-General for Eastern Canada, who
has taken an active interest in the Dental
Clinic at the Concentration
Camp, Toronto.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION" AS WELL AS THE "POUND OF CURE"

VOL. 5.

TORONTO, JANUARY, 1915

No. 1

Military Dental Service at the Toronto Concentration Camp

EDMUND A. GRANT, ARMY DENTAL SURGEON.

THE country is at war, and the best energies of the State and individual are called upon to aid our cause and make it victorious. The question which is paramount in everyone's mind, at the present time, is "What can I do to help?" Short of enlisting for active service, which to many is almost prohibitive, doubtless the most timely and patriotic service which could be rendered by the dentist would be to put into a healthy condition the mouths of those who are willing and anxious to go to the front, but are prevented because of defective teeth.

Many men have been rejected already on account of defective teeth, although otherwise fit. Military regulations require that a recruit, in order to pass the medical examination, must have three sound bicuspid or molars occluding on each side of the mouth. There may be one tooth above, occluding with two in the lower jaw on each side or vice versa. One partial denture is allowed, but of course a full denture is not accepted.

It can be easily seen from these regulations that a man might pass the examination without possessing an efficient masticatory apparatus or even a healthy mouth. The men then fall into two groups (1) Those rejected solely on account of defective teeth; (2) Those accepted but requiring dental treatment to place the mouth in healthy condition.

Regarding the first class, many of these men have not

the money to pay for the necessary work, and it would seem to be the duty and privilege of the dental profession to look after them. In Toronto the need for this work was first discussed in the Dental Rifle Club, and subsequently was brought up at a meeting of the Toronto Dental Society when a committee, of the Educational Committee of the Society, was appointed with Drs. C. F. Colter, Arnold Semple of the Dental Rifle Club, and Drs. R. W. Hull and E. A. Grant, Army Dental Surgeons, added. They were instructed to interview the military authorities and offer to look after these men, provided they were first examined by an Army Dental Surgeon, and also that there would be some assurance that the men would be accepted on completion of the work.

This committee met and deputed Drs. Grieve and Colter to interview Lt.-Col. J. T. Fotheringham, Assistant Director of Medical Services. At the same time the Educational Committee of the Ontario Dental Society was considering the matter in a provincial way and authorized Drs. R. G. McLaughlin and R. J. Reade to interview Major General Hughes. As a result of these interviews the enthusiastic support of Col. Fotheringham was obtained, as is shown in the following letter:

Toronto, Ont., November 16th, 1914.

MEMORANDUM

From Assistant Director Medical Services, 2nd Division.
To Acting Director-General Medical Services, Ottawa, Ont.
Dental Services.

I venture to forward the following proposals for your consideration. Rejections on account of teeth fall into two groups; those rejected at the preliminary examination, and those accepted but with minor defects of the teeth. The Dental Society of Toronto and the Ontario Dental Society recently met and very kindly expressed a desire to co-operate at this juncture, and I should like authority to fall in with their proposals, which are, in brief, as follows: As regards rejections solely on account of defective teeth, it is proposed by the Ontario Dental Society to select an officer from the Regimental Headquarters or locally, without cost to the public, to do the work necessary for the acceptance as "fit." This to apply to all future contingents.

I have already provided the Secretary of the Ontario Dental Society with a list of the Divisional Headquarters.

and the local Headquarters of this Division. The Toronto Dental Society has expressed its willingness to do the same for the city units.

With regard to the second group, those accepted but with cavities, or with some minor oral defects, the Dental Society of Ontario has offered somewhat similar arrangements; this group, however, being under pay, and hardly, I think, entitled to treatment gratis, it is proposed that a Board of Dental Officers, which can be readily formed in Toronto, be given authority to inspect all mouths referred to them by the Regimental Medical Officers of the expeditionary force here, and that they should submit a statement, which can be approved by me, of the work necessary in each case, and send the men to the dentist selected by them from a list given them by the Dental Society of Toronto. Such work, being certified, the dentist might be given the pay of an Honorary Captain for each day's work done. No day's work to consist of less than two cases. An alternative proposal would be that Dental Surgeons, A.M.C., might be detailed to do the work in an office specially ordered here in connection with the Stationary Hospital of the camp. Four are available, and the work would thus go on continuously until completed for this portion of the expeditionary force.

It seems to me very necessary to have this work done before the troops leave, and very advisable to meet the patriotic wishes of the two Dental Societies named; they undertake, further, to interest the Dental Societies of all the Provinces in the same way. They are, of course, anxious to prevent imposition, which can be secured by the procedure outlined above.

For your information, I add the names of the officials of the Dental Societies referred to:—

(1) President, Dental Society of Toronto, Dr. G. W. Grieve, 2 Bloor Street East, Toronto, Chairman of Special Committee.

(2) Secretary Special Committee, Dr. C. F. Colter, 26 College Street, Toronto.

(3) Ontario Dental Society, Chairman of Special Committee, Dr. R. G. McLaughlin, 54 College Street, Toronto.

(4) Secretary Special Committee, Dr. R. J. Reade, 2 Bloor Street East, Toronto.

(Signed) J. T. FOTHERINGHAM,

Lieutenant-Colonel, A.D.M.S., 2nd Division.

Approved by the G.O.C., 2nd Division,

and forwarded to the D.G.M.S., Ottawa.

Although at this stage recruiting for the second contingent was almost completed, Captain Vansittart of the 9th Field Battery applied to me to have some recruits attended to, and, being authorized by Col. Fotheringham to go ahead, about twenty-five men were examined and sent to various dentists for free work. The following dentists were kind enough to take cases:—Drs. Ante, D. Baird, F. G. Brethour, W. A. Black, C. F. Colter, J. S. Chambers, H. C. Duffin, R. H. Henderson, G. Howard, G. G. Jordan, E. C. McDonald, F. R. Mallory, T. N. McGill, E. W. Paul, J. E. Rhind, R. C. H. Staples, and R. C. Woollatt. A great deal was also done by the School of Dentistry of the Royal College of Dental Surgeons. We were also greatly indebted to Claudius Ash & Sons for supplies, and to Allen & Rollaston, E. T. Campbell, C. L. Daly and other dental laboratories for free laboratory work.

If a third contingent is mobilized, there will be a great deal of this work to be done, and there should be no trouble if the generous response to the first call is any indication. The work was undertaken so willingly that it was a pleasure to co-operate in it. The following letter was received from Lieutenant-Colonel G. Elliott, Medical Examiner of the Battery:—

Toronto, 17th Dec., 1914.

Dr. Edmund A. Grant,
229 College St., Toronto.

Dear Dr. Grant:

Your letter of Dec. 8th, enclosing one from Dr. Mallory, received; also your letter of Dec. 15th, enclosing list of men that you and your confreres are doing the dentistry necessary to qualify them for the 9th Field Battery.

Would you please be good enough to convey to those members of the dental profession who have been kind and generous enough to do this work free of charge the appreciation of myself and fellow-officers of the Artillery.

All the men have been taken upon the strength of the battery and are now on pay.

With kind regards, believe me, yours very truly,

(Signed) J. E. ELLIOTT.

Arrangements for the men already in camp are outlined in the following letter:—

Toronto, Ont., December 1st, 1914.

From A.D.M.S., 2nd Division, to Mr. Edmund A. Grant, 229 College Street, Toronto:

Dental Services.

Authority has been given for the establishment of a Dental Clinic here, which it is proposed to start at once.

It will be carried on daily, Sundays included, with one of the following Dental Surgeons in charge, in the order given:

1. Mr. R. W. Hull, Jr., Room 1, 2 Bloor St. West.
2. Mr. Edmund A. Grant, 229 College Street.
3. Mr. Orvil Elliott, Ryrie Bldg., Yonge Street.
4. Mr. George Gow, 1 Bloor Street East.

The arrangements will be in the hands of Mr. Hull, who will give notice of the date and hours of attendance.

(Signed) J. T. FOTHERINGHAM, Lt.-Colonel,
A.D.M.S., 2nd Division.

Since then, through the representations of the Oral Hygiene Committee of the Ontario Dental Society, the scope of the clinic has been enlarged. The Government has made an appropriation of \$2,400—\$600 for each of the four regiments, which, it is thought, will be sufficient to put the mouths of every man in camp in a clean healthy condition. The work to be done will consist of extraction, prophylaxis, judicious pulp treatment, and cement and amalgam fillings. No dentures are to be made.

A five-chair clinic has been installed at the camp with a fairly complete equipment. It will be open from 9.00 to 12.30 a.m. and 2 to 6 p.m. each day, and manned by an Army Dental Surgeon and four civilian dentists each morning and each afternoon. There will also be a Quartermaster-Sergeant, who will have charge of the stores and keep a record of the work done, and an orderly to clean up, sterilize instruments, etc. The Army Dental Surgeon will receive the pay and allowance of his rank; *i.e.*, Lieutenants, which amounts to \$4.10. The civilian dentists will receive the pay of an honorary captain, \$3.00 per day, which is equivalent to a colonel's pay of \$6 per day, for each half day's work. This, of course, does not recompense the dentist for his time, and a reference to Colonel Fotheringham's first letter will show that he fully appreciates the patriotic sacrifice they are making in volunteering to do this work.

Dr. R. W. Hull, Senior Army Dental Surgeon in Toronto, has charge of the clinic, and has systematized the work with a view to completing twenty to thirty cases a day, so that all the men will be looked after. To accomplish this some teeth requiring extensive treatment, and which in private practice might be saved, will have to be sacrificed. He considers

that it will be better to have all the men at the front with fairly clean, healthy mouths than to have half leave with perfect restorations and the other half receive no attention at all.

The Toronto Dental Society has undertaken to supply the dentists to man the clinic and a sub-committee of Drs. F. C. Husband, W. Grieve and C. A. Kennedy have already secured the names of thirty who have promised to take their turn, and they hope to make their list much larger.

The clinic started on December 15th, 1914, but it is too early as yet to give any report of the work. However, it is a splendid opportunity for the profession to demonstrate to the Government and military authorities the importance of their work, and when the report is drawn up and presented to the Government it should be possible to obtain greater recognition for the dentist in military circles.

As showing the appreciative attitude of the military authorities toward the dental work undertaken at the Toronto camp, the following letter is of interest:

Department of Militia and Defense.

Toronto, Ontario, December 29th, 1914.

Dear Sir,—I have much pleasure in informing you how much I appreciate all the good work that is being done by members of your society attending to the teeth of the troops forming the second Canadian contingent stationed at Exhibition Camp, Toronto. I fully realize how very necessary it is that all men proceeding on active service should have sound teeth and that there are many men who, without your valuable assistance, would not have been fit for service but are now able to proceed with the contingent.

Yours very truly,

F. L. LESSARD, *Major-General*,

G.O.C., Second Division.

To Dr. F. C. Husband, Secretary,

Toronto Oral Hygiene Committee,

2 Bloor Street East, Toronto.

Dentistry in the Militia

A. D. A. MASON, D.D.S., TORONTO.

WHEN a man takes the oath of allegiance and enters the militia, from that moment until he obtains his release he is owned, "body and soul," by the military authorities. He is under the strictest discipline and the surveillance of his superiors.

Thus the authorities exercise a sort of paternalism over the soldier. His legitimate wants are supplied and he is amply provided with all the necessities of life. Departments of the militia have been organized to see that the soldier is fed, clothed, transported and supplied with ammunition. Other departments attend to his health and make his surroundings sanitary and comfortable, and when he passes beyond human aid priests and ministers are provided to minister to his spiritual comfort.

For some unaccountable reason, it would seem as though the soldier's dental needs have been sadly neglected or at least provided for in an astonishingly meagre fashion. The authorities, by their regulation, admit that teeth are necessary, but take little means of saving these important organs, much less maintaining them in a condition free from disease. If the teeth are of sufficient importance to cause the rejection of a recruit, surely they are of sufficient importance to be maintained in a condition of health.

The remarkable thing is that such laxity should have been permitted in regard to the teeth while so much care and wisdom has been shown in organizing the other branches of the service. A whole corps has been provided for the care of the soldiers' horse, while he himself is unable to properly masticate the good food supplied from the commissariat department, or, what is worse, the soldier is permitted to swallow quantities of pus each day from abscessed teeth or pyorrhœal pockets. An efficient soldier is thus rendered unfit for service and is passed back from the trench to the field hospital, of no avail because of the lack of the service a well-organized dental corps could supply. One cog in the wheel is certainly missing. How can the machine be perfect or efficient?

If Dentistry is a necessary science in civilian life (and this is proven beyond a doubt), how much more necessary

during the turbulence and strain of war. The "missing cog" should be added at once, for the army does not only lose the active service of the sick soldier, but is forced to assume the added burden of caring for him and nursing him back to health.

The military authorities cannot hope to secure the active co-operation of the Dental Profession until the Dental Surgeon is placed upon a proper footing along with the other units of the service. Why should there be a veterinary, army service and medical corps and no dental corps? Why should not the dental corps receive equal rank with other units? While this status is not accorded, representative men of the dental profession will not be attracted to the militia as they otherwise would be.

A dental corps of the proper calibre could be easily formed, and would solve many difficulties for the department and render invaluable assistance to the medical unit of the militia. One is aware that in some small way something is now being done, but why not do it properly? Why not have a unit that the militia, as well as the dental profession, would be proud of? This will be possible as soon as the Militia Department sees fit to organize an efficient Army Dental Corps as a separate unit of the service.

Dental Service in Military Hospitals

PETER McQUEEN, writing in a recent issue of the *Boston Congregationalist*, describes the magnificent work of the American Ambulance Corps operating in Paris under the supervision of Dr. Blake of New York.

When war broke out this was a small hospital in the Faubourg St. Germain, with accommodation for sixteen patients. It was founded in 1870, did noble work in the Franco-Prussian War, and was later organized to work for the American Colony of Paris. Prominent Americans have contributed generously since the outbreak of the European war, and Dr. Blake now has four hundred beds at his disposal, the French Government having donated the new buildings of the Lycee Pasteur at Neuilly.

Mr. McQueen says that in the first place the Americans began their work of healing by having the free services of the best American dentist in France two whole days a week. Every patient now has his teeth looked after. The claim is

made that the English patients have the worst teeth and the Arabs have the best. Many men suffered more from their teeth than from their wounds. Septic conditions were very common among both French and English patients, while the Moroccans and Algerians have almost perfect teeth.

By attending to the teeth the American doctors, it is claimed, cure the wounded ten days faster than any other corps now working either with the Germans or the Allies.

Dental Requirements for British Army

SURGEON-COLONEL LENNOX writes from the Recruiting Office, Dundee: Hitherto in Dundee about one-third of the rejections of those desirous of joining the army have been because of deficient teeth. It will be gratifying to many of these applicants to know that by a War Office letter, dated 14th November, 1914, men with sound artificial dentures are now not to be rejected for failure to reach the dental standard,—in other words, that well-fitting artificial teeth will be accepted as equivalent to natural teeth.—*Dental Record*.

Toronto Dental Rifle Association

C. F. COLTER, D.D.S., Captain.

REALIZING, as all Canadians do, that when Britain is at war, Canada is at war, a number of the dentists of the City of Toronto were called together to talk over the situation from our standpoint as professional men, to see what was possible for us to do to best assist the cause of our great empire in our humble way. From several viewpoints the situation was considered, and, finally, after two meetings, it seemed to be the unanimous opinion of all that a Dental Rifle Corps be formed. In pursuance of this decision a general meeting of the dentists of Toronto was called for the evening of September 22nd, at eight o'clock, in the lecture room of the Dental College. Considering the prevalent inclement weather, there was a splendid turnout. Dr. Kennedy occupied the chair and called on Dr. C. F. Colter to explain the cause of the calling of the meeting. Provisions

had been made for Captain Osborne, of Military Headquarters Staff, to attend the meeting and assist in the organization, which he did in a splendid manner, and when all had been sworn in who wished to, the Toronto Dental Rifle Corps was launched into existence with a numeric strength of sixty. Dr. C. F. Colter was made Captain, Dr. Arnold Semple, Secretary-Treasurer, and Executive Committee, Drs. Peaker, Jordan, Hume, Woollett and F. Jones.

On the evening of September 28th we had our first turnout for rifle practice at the Armouries, in which thirty-five dentists participated, some of them making splendid scores and all doing well. Owing to the fact that so many rifle corps were being formed in the city, it was deemed advisable by some gentlemen to form a central organization, which in due time was accomplished, and called the Toronto Rifle League, which we, as the Toronto Dental Rifle Association, joined.

A competition for the Osler Trophy was called, in which we put a team of ten men and, considering the fact that we had to shoot against a great number of Toronto's "Bisley Men," our team shot well and their scores were creditable. About this time ammunition became unavailable. Our executive met and a portion of the business they considered was the instructing of the corps in drill. Arrangements were made for the use of St. Lawrence Hall, and on November 5th, at eight o'clock, we met for our first drill, with about forty-eight in attendance, and all were agreeably surprised at the enjoyable evening afforded. At the same executive meeting was discussed the advisability of the dentists of the city giving their services for the purpose of doing the necessary dental work to pass volunteers who were being refused solely on account of teeth conditions. After some discussion it was moved and carried that the idea be proposed to the Toronto Dental Society meeting, which was to be held in a few days. This idea was carried out. On November 25th, word was received by the Secretary that we, as a rifle corps, were to be inspected at our earliest convenience and for some time two evenings a week were devoted to our drill. On December 18th we were inspected by Major Barker, and not only passed our inspection, but were spoken of and to, as a corps, in very flattering terms. We had out for the inspection sixty-eight members out of our total strength of eighty-one. Word has since been received that we are to receive seventy rifles, which will be applied for at the earliest possible moment. Bearing in mind the object of this organ-

ization, it is in my humble opinion, the duty of every dentist in Toronto to, at once, become connected with this organization, which is gotten up solely with the idea of protecting our homes in case of necessity. Any desiring to join may communicate with Dr. Arnold Semple, 905 College Street, Toronto. Telephone College 6140.

The Army Dental Surgeon

ATENTION is drawn to articles in this issue upon the dental arrangements at the Toronto Concentration Camp by Mr. Edmund A. Grant, and the Status of the Army Dental Surgeon by Dr. A. D. A. Mason.

The plans adopted by the military authorities at the Toronto Camp to meet the present emergency seem to be working very well, but under no circumstance could the present arrangement be considered ideal or as a permanent solution of the army dental question.

The present emergency will convince the military authorities of the real need of an efficient dental unit in the army. The organization of an independent Army Dental Corps, with its own grades of rank with qualifications for each, will no doubt prove ultimately to be the wisest and best solution of the problem.

The Relation of the Pathological Laboratory to the Dental Profession

JOSEPH S. GRAHAM, M.B., TORONTO.

Professor of Histology and Pathology, R.C.D.S. of Ontario.

LAST summer the Board of the R.C.D.S., on the recommendation of the Faculty Council, decided to enlarge the laboratory where the pathological and histological work is done, and also to purchase extra equipment. In addition to this a scholarship of \$1,000 was granted to one of the most promising men of the final year at the college. Dr. Harold Box was the man selected, and I am glad to say that he has more than made good. Dr. Box spent the summer in the laboratories of the Toronto General Hospital and the University, and by the time the college opened was in a

position to carry on the routine work and has since been giving his entire time to it.

All this was done in order to bring the pathological department into closer relation with the Infirmary of the College and with the profession at large.

The object of this paper is to show in what manner the laboratory can be of service to the profession and in what way the profession can be of aid to us.

The method we are developing in order to bring our department into closer relationship with the Infirmary briefly is this. Each morning Dr. Box looks over the cases presenting themselves for treatment, selects such cases as he thinks suitable and allots them to students of the final year. These cases are then taken to the laboratory where the history, both from the general and dental, aspects is written. An examination of the patient follows, and after this has been completed we require the student to carry out some routine work.

He must do a red and white blood count, hamoglobin estimation, examination of the urine and estimation of blood pressure. After the student has done this we direct him as to what further work must be done on his patient in order to make his history complete. It might be necessary to make cultures and smears in some cases, or a reaction for tuberculosis or syphilis. In the case of a "Bleeder" coagulation time of blood would be done. In the event of finding, during the examination, any new tissue formation, a small bit of the tissue would be removed, sectioned and a diagnosis made. Although it is impossible for the student to do all this himself, we make him follow all the steps taken in order to show him how the laboratory can help him in actual practice to make a diagnosis.

We are attempting to show the student the relationship between the general condition of the patient and the condition of his oral cavity, also the relationship between the condition of the mouth and general health.

These histories have progress notes added to them from time to time in which are shown the benefit of treatment. Dr. Webster, who takes up the clinical aspect of the cases, and the writer both feel that while only a small beginning has been made the results are very gratifying.

There is one feature lacking in our department which we feel can be overcome if we can enlist the co-operation of the profession. It is the pathological museum. Patients frequently present themselves to the dental surgeon suffer-

ing from conditions which necessitate removal of tissues by the dental surgeon or by the surgeon to whom they are referred. If the members of the profession would forward such specimens to the college in jars containing 10 per cent. formalin solution, and use their influence with the surgeons to obtain suitable specimens from them, it would not be many years before a first-class museum would be established. It is always a great aid, and almost an essential, that a short history accompany the specimen. These histories we shall file where they will always be at hand for reference either by you or by us.

Another way the profession can be of great help to us is by saving extracted teeth and placing them, immediately after extraction, in a bottle containing 10 per cent. formalin. It is necessary for teeth to be placed at once in the solution on account of the fact that if allowed to dry the enamel and dentine give up water unequally and the teeth split when ground.

It is impossible for us to obtain a sufficient number of teeth and the department would feel grateful if, after you had saved twenty or thirty, would forward them to the college to our department.

Before closing, I would like to say that in addition to the laboratory work we would do for the profession, we would be glad to answer any questions along our lines which you might care to write us about, also to look up the literature and, where possible, give a brief summary of the subject if desired. In this way we feel we could bring the pathological department into close relationship with the profession not only in Toronto, but also in the provinces. We want you to feel that not only is our department a useful adjunct to teaching in the college, but also of service to the profession at large. We hope that you will make use of us.

Please address letters to the Pathological Department, Royal College of Dental Surgeons, 240 College St., Toronto.

Our Buffalo Letter

BY HABEC.

ANOTHER EVIDENCE OF GOOD SPIRIT.

A GAIN we have become obligated to our good friends in Toronto, and all we have been able to return has been the overworked and stereotyped phrase, "Thank you." To be sure, we really meant it, deeply and sincerely, but it seems to express at such times so little of what we really feel.

It was all on account of the splendid entertainment accorded to five members of the Dental Advisory Board of the Board of Health of Buffalo, who were the guests of the Toronto Dental Society, at a very large and enjoyable meeting on the evening of Nov. 9, and of the Toronto members of the Oral Hygiene Committee, at a convention of the Oral Hygiene Workers of Ontario, on Tuesday, November 10th, 1914. It will linger long in our minds as one of the red-letter days of our dental meeting experiences. It was also proof positive of the deep interest and common purpose in the great cause of oral hygiene with which all those in attendance were thoroughly imbued. Speaking for himself, Habec has never undertaken any work in dentistry that has afforded him so much satisfaction as has this great cause and he is much gratified to have been chosen as one of those who have control of the movement in Buffalo. The purpose is grand, the results magnificent and the good done forms an endless chain which will reach to the end of human existence. If any one of the five had lacked such comprehension of the work on the morning in question, surely he must have been early converted, for a visit to one of the largest public schools was all that was needed. After an examination of the well equipped clinic room we visited several classrooms and looked into the mouths of a great many little scholars. The conditions were universally commendable and the methods employed seemed to be above criticism. Next we visited the municipal clinic and were much pleased with all that we saw and learned regarding the management and the work accomplished. We learned much that we are rapidly putting into practise in our dispensaries in Buffalo.

There is little doubt but that the City of Toronto has the best organized system for the free care of the mouths of the

children of the worthy poor of any city in the country.

We have no city in the U. S. that approaches Toronto in point of methods and efficiency. The knotty problem has been splendidly solved and the fact that in public schools there are thirteen free clinics, speaks for itself. Added to these is the municipal clinic and there are three more in prospect. Can any city of any country make a better showing than this? We think not.

The school clinics are under the immediate supervision of Dr. Doherty, whose superior, Dr. Struthers, is the chief medical inspector for the city of Toronto. Dr. Bothwell has full charge of the municipal clinic and is doing a most important work. These men should be very proud of the grand work they are identified with, for they are real benefactors. In Buffalo the Dental Advisory Board, which is composed of seven dentists, has been given full charge of this work by the Health Commissioner and we are now beginning to crystallize the methods and plans, so that soon we will be able to place before the authorities an excellent report. We have three clinics in operation, two of which are devoted to the care of school children, which are doing splendid work. The other clinic is located in the dental school where eight chairs with the same number of operators are constantly in use. This makes the facilities equal to those of ten individual clinics with an appropriation of \$7,000 annually. Out of this sum must be deducted the salaries of two inspectors and two women assistants. We believe that we will be able to get a larger appropriation after we have made our first yearly report.

But to revert to the convention. We would be inexcusably remiss if we did not speak of the social side of the meeting. At luncheon we were the guests of the Canadian Club (not the Walkerville brand), where we listened to an address by an authority relative to railway conditions in the U. S., after which we visited the new museum, an institution of which Toronto should be very proud. It proved a surprise to the visitors and is filled with splendid specimens and relics. One could spend days filled with pleasure and profit within its walls. It will ere long be one of the best museums in the land and Toronto has cause for congratulation. The evening's programme was most enjoyable. After discussing an excellent banquet at the Walker House, it was followed by papers and discussions upon the different phases of the hygiene work, and much of benefit was gleaned by the visitors from Buffalo, not the least of which was the inspira-

tion which we have retained and are putting into practical form in our work here.

The names of a few of our friends who added materially to our enjoyment of the day stand out prominently; first in order is Rob Reade, who met us at the train on Monday afternoon and stuck manfully at his post until very early Wednesday morning. His perseverance and faithfulness are highly commendable, and the manner in which he carried his load (of responsibility) was truly marvelous. Toronto would be but a barren waste to Habec without his esteemed friend and cocktail eliminator, Robert J. The boys all voted Dr. McLaughlin a prince of good fellows, and his constant efforts to make the day an enjoyable one for us will not be forgotten. He has something coming to him the next time he finds himself unprotected and alone in Buffalo. And there came also one Wallace, the chauffeur in his "merry Cadillac." To him did we also stick and found great comfort thereby being whisked thither and yon as if by magic. Late in the day, however, Habec renigged and left Wallace to his fate. Thereby hangs the tale of the old grey horse, the gruesome details of which need not be laid bare to the morbid public. It is enough to know that the old grey horse was struck somewhere between the haymow and the oatbin and felled to the hard and unsympathetic pavement. Just to show his importance and perhaps a little of his disposition, he switched his tail and knocked out the plate glass front of Wallace's buzz-wagon. This was the only real tragedy of the day, except that Robert was unable to satisfy an abnormal appetite for olives. Again we impotently gurgled "Thank You."

YES! THIS WAS A REAL ONE.

Be it known that there was a real Dental Convention in Buffalo in November last. It was the annual union of the fifth, sixth, seventh and eighth district societies, and the three days were surcharged with the essence of the latest extracts of teeth. Five hundred and twenty-five oralites crossed the tape, and the stacks of free samples disappeared like a snowball in—the hot side of a thermos bottle. And they were all there too, even to our old friend Sal of the Hepatic family.

Of course Habec was surfeited with these souvenirs, for in an unguarded moment he had permitted the fair registrar to attach the word "Reception" to the lapel of his coat, and the army of sampleites acted accordingly.

But when, like Habec, you have reached the still water

stage of dental meeting experience, you will begin to realize how short sighted the Creator was when he furnished you with but two hands. You meet a bunch of ten with as many hands stretched forth to greet you and how helpless you feel with just two waving fins. Besides, if you are real polite you can use but one and so you hesitate, one step, fox trot and pretty soon do the maxixe from one to the other until the good old handshake that loosens your false teeth and leaves your toupee dangling to your left ear, is left outside the kitchen door to freeze up in the wash basin on a zero night. By the time you reach the five hundred and twenty-fourth one, if you are dispositioned like Habec, you gather the last one under your arm and repair to the depths below where you appeal to the smiling "chemist" to mix several more of the same—and again you wish for more hands and perchance, more esophaguses (or something like that), also.

Well, it was that kind of a meeting for some, but much different and much better for others. An array of talent was displayed of unusual coalescence. There was Chayes and Stewart, of New York, in special team work; Leon Williams, of London, and Essig, of Philadelphia, exploiting Truebite teeth; Robin Adair, in a monologue pyorrhea stunt; a "movie" reel gotten up by the oral hygiene committee of the New York State Dental Society and other numbers of equal interest. And as for notables, the convention was especially distinguished. There was Rudy Hofheinz, Billy Smith, Billy White, Billy Belcher and various other Billies. Also a pleasant surprise was the unheralded advent of Dr. Watson, of Berlin, former assistant to the Kaiser's dentist. Indications are that he will remain in this country for some time, as his clientele have largely moved to the firing line, where many have already filled their last cavity without the aid of a dentist.

The clinics were excellent, being few in number, but many in quality, so that the whole programme was one of harmony and class quite unusual. Besides we were favored by the presence of a few of our Canadian friends, for which we are duly thankful. We would have been proportionally thankful had the number been many times greater, and we can assure them that there is neither duty nor war tax on anything they may carry back in their heads or stomachs, for that matter.

We will now start the Victrola.

FLETCHER IS NOW FLETCHERIZING.

Mr. Foxy Fletcher, late of Australia, may for the next year at least condescend to own Buffalo as his home. Owing to a peculiar combination of circumstances over which he had no control—principal of which was the intelligent jury—Fletcher is now regularly Fletcherizing at the sign of the Penetentiary of Erie Co., N. Y. It is needless to say that this little mark of distinction conferred upon him by the twelve charitably inclined gentlemen of the jury was decidedly opposed to his well-formed plans for the long winter season. Mr. Eddie Schultz, the genial half of the Webster Dental Company of Buffalo, proved to be another circumstance which Fletcher could not control. In fact, after Eddie became inoculated with the detective germ, he could see nothing but Fletcher and vengeance, and surely the results obtained would be gratifying to a more renowned “detector” than Eddie.

Following the foregoing prelude is appended a few concise facts leading up to this grand finale; Fletcher’s plan was to apply to some of the leading dentists in each town he visited with a proposition to pay \$350 for six month’s tuition, he being very desirous of learning American methods to practise in Australia. He succeeded in finding a Buffalo dentist who accepted his proposition, but on the day the contract was to have been signed and a substantial portion of the fee paid over, the South Seas Wonder left a letter stating that, owing to the receipt of a telegram, he was leaving by the first train for Honolulu to hasten to the bedside of a desperately ill relative. During the few weeks he remained in Buffalo, he had persuaded Mr. Schultz that he was responsible for indebtedness incurred and managed to get temporary credit. When he hastened away on his sad journey to far away Honolulu, the dental goods accompanied him. The next heard of him was that he had found a susceptible dentist in Detroit who had agreed to accept him as a student under the same plan he had followed in Buffalo, and very soon thereafter several dental offices were robbed of considerable gold and other things of value. Mr. Schultz immediately procured a warrant, which was served in Indianapolis, and the adventurer was duly returned to Buffalo where, after trial, he was convicted of grand larceny and relegated to the penetentiary. Let us hope that the Detroit dentists will take up the good work when he is liberated and give him all that is coming to him. We should endeavor

to make an example of such crooks, for they seem to be on the increase, and we appear to be rather easily victimized.

HARVEY RECEIVES MORE HONORS.

Dr. Harvey J. Burkhart, whom many of you know as past president of the National Dental Association and present vice-president of the international body, has just been elected Mayor of Batavia for a second time. The special distinction at this time is because of the fact that Batavia has just acquired the dignity of a real city, so that Harvey's name will go down to posterity as having been its first city Mayor. We rejoice.

HABEC.

Plaster, Vulcanite and Esthetics *

GEORGE H. WILSON, D.D.S., CLEVELAND.

PLASTER of Paris is made from the mineral gypsum. The chemical composition of pure gypsum is calcium sulphate and water. Gypsum is prepared for market by grinding and burning, and mixing with accelerators, and retarders. The products of manufacture are designed for a definite purpose, and cannot be interchanged advantageously.

There are requirements of practice that make a demand for as many classes of plaster: (1) for impressions the plaster should be quick setting, expand but little (not contract) and easily broken; (2) for casts the plaster should be as little changeable while crystallizing and under stress as possible; (3) for flasking and luting a medium between the preceding two is required. However, the first class of plaster can be dispensed with by adding a chemical substance to a well chosen third class plaster, and is used for impressions. A strictly impression plaster is a dangerous thing in the laboratory, as it is unfit for casts and flasking, and is too apt to be improperly used. The addition of sodium chloride or potassium sulphate to a high grade suitable plaster for flasking answers well for impressions.

If the mix of French's regular dental plaster is made,

*The profession and ORAL HEALTH are indebted to Dr. W. B. T. Amy, Toronto, for this excellent report of the last meeting of the Toronto Dental Society.

containing one ounce of water and two ounces of plaster and left exposed until it ceases to lose weight (about 25 hours), it will be found that it has lost approximately 22% of its entire weight. As the loss is the water, the 22% deducted from the one-third (33.3%) water would show approximately 11.3% had combined permanently with the plaster.

The points thus derived from this hydration experiment are: That it is impossible to mix dental plaster without an excess of water; that the larger the excess of water the less dense and weaker the plaster, and that the smaller the excess the denser and stronger the plaster. Conclusion: the plaster should be hydrated to meet the requirements of the operator.

The theory of setting of plaster is the result of two distinct series of operations that take place simultaneously, supersaturation and crystallization. The particles of calcium sulphate in the act of hydration are dissolved in the water used to gauge them, and produce a supersaturated solution; the solution thus formed deposits crystals of the hydrated sulphate. These crystals gradually increase in size, and form a compact mass in the same way as do all similar crystals deposited slowly from a saline solution, and this process continues as long as any of the more anhydrous sulphate remains available to become dissolved and to keep the solution supersaturated.

There are three properties of plaster of Paris on the workings of which the success of the dentist almost wholly depends: contraction, expansion and compression. Too much water will cause a maximum of contraction and a minimum of compression or resisting strength, while too much plaster gives resisting strength, but unfortunately a maximum of expansion.

In impression taking, a weak plaster being desired, an addition of potassium sulphate can be made to hasten the setting and reduce the expansion and strength. For use in casts plaster of Paris cannot compare with the Spence Plaster Compound.

The Spence Plaster Compound changes form less than any of the pure plasters and attains its maximum strength in one hour; it is stronger in thirty minutes than a pure plaster at its maximum.

This compound is possibly four or five times as resistant to compression as any of the plaster of Paris mixes; its contraction or expansion is very small. This very useful

compound is composed of plaster of Paris, Portland Cement and chemicals to control its setting and expansion properties.

The working of this compound is more laborious than mixing plaster of Paris. The ratio of water to the compound is one to four.

For a cast a fluid ounce of water is placed in the plaster bowl, and three measured ounces of the compound are added and thoroughly spatulated with a stiff spatula, until it becomes soft and plastic, after which a half ounce more may be thoroughly incorporated. The remaining half ounce may be better added one-half at a time. It must be spatulated and kneaded in the bowl until the mass is of putty-like consistence. If properly mixed it can now be taken in the fingers and squeezed to expel gases. It is now packed by degrees into the impression and jarred to fill all parts. If now turned over on a piece of celluloid it will not stick when removed.

VULCANITE.

Vulcanite for artificial dentures is composed of carbon, 10 parts; hydrogen, 16 parts, combined with sulphur in any proportion from 1 to 20.

THE PHYSICAL PROPERTIES.

Rubber expands more rapidly than any other solid body. Its rate of expansion at ordinary temperatures from 70 to 90 degrees is over 6 times that of iron, about 5 times that of brass, and 4 times that of zinc which is the most susceptible of all metals to expansion by heat. It expands quite regularly up to 200 degrees, from this to the melting point 250 degrees, it expands excessively.

In vulcanizing, soon after chemical action begins (248 degrees) expansion ceases and contraction commences, continuing to a greater degree than the expansion in heating up.

HOW TO VULCANIZE RUBBER.

Dr. Wilson by a series of experiments, the results of which he had with him, showed how essential proper vulcanization is to the welfare of the denture. The conclusions arrived at by these experiments:

The flask should be well warmed, but not above 212 degrees. The mould evenly packed with red or black rubber or a combination of the two, but must in no place be thicker than 3 mm. or at the outside 4 mm.; all space beyond that must be filled with pink or white rubber. The flask must be cautiously nearly closed under pressure, but the final closure should be in the vulcanizer under pressure from a volute

spring attached to a Donham clamp. With this method no gateways are needed, but if the flask is bolted gateways opening into vent spaces are imperative.

Vulcanizing should be done in steam, and at high temperature and short time, that is, sufficient heat should be applied to reach the maximum temperature (320 degrees) in 25 minutes, not varying more than 5 minutes either way; then the high heat should be maintained for say 55 minutes.

Preparation of the case for flasking.—Strings are used for outlining the festoons and periphery of the gum. The object of the festooning string at the cervical portion of the teeth is to give the proper thickness to the margin of the gum. The string used for this purpose is waxed dental floss, twisted very hard, doubled and twisted again. Wax the string well with softened wax and apply it by grasping the left heel of the wax model between the fingers and thumb of the left hand, with the occlusal surface of the teeth upward; place one end of the string at the distal surface of the second molar, pressing it gently into the wax; outline the margin of the gum, using the wax spatula to carry the string well into the interproximal spaces.

The peripheral string should be well waxed, wrapping twine placed at the outer edge of the wax, and secured in place by melted wax made smooth with a hot spatula. The peripheral string should be applied at the line of separation of the flask and this must be, in cases of heavy restorations, at the widest portion of the wax model.

The next step is to cover the buccal and labial surfaces with a strip of number 60 tin foil. The number 3 instrument of the Evans set of carvers is especially adapted for adjusting the foil. The strip of tin foil, about a third of a sheet, is placed over the wax and teeth and pressed as closely as possible with the fingers. The surplus tin is trimmed to a little below the top of the teeth with a pair of scissors. The tin should be slit between each two teeth.

Hold the work in the left hand, seize the instrument by the hand grasp, rest the thumb upon the occlusal surface of the second molar, and burnish the tin closely to the tooth and against the festoon string.

Continue this operation with all the teeth. After adjusting the tin about the teeth the metal must be burnished over the string to give the desired thickness of the gum and the contour of the festoon. This is done by holding the plate and burnisher in the same manner as before.

The instrument must extend one-sixteenth of an inch be-

yond the string and at the same time must rest upon the body of the tooth while pressing the tin down over the festoon string. By this means a proper thickness and contour are given the margin of the gum without forming an unnatural beaded edge. After all the teeth have been thus treated, the position of the plate should be reversed in the left hand, so that the thumb of the right hand may rest upon the periphery of the base plate while burnishing the tin from the festoons toward the periphery, with a pair of sharp curved scissors trim the tin flush with the peripheral string, but do not permit it to overlap the vulcanite base plate.

The case is now ready for tinning the lingual surface, use number 60 foil, and if the vault is a high one slit the tin from the middle of one side to the centre. Place the inner end of the slit over the middle of the vault, and one edge of the slit along the raphe to the palatal border; press the side of the foil against the wax and teeth; press the other half of the tin in the same manner, into position permitting the slit portion to overlap the first half. With sharp scissors trim the foil nearly down to the teeth. Remove the foil and place it upon a plaster or metal cast, having well defined rugae, and burnish the rugae into the foil. Remove the foil, turn it over, and fill the impression of the rugae with wax, also smear the remainder of this surface with a thin layer of wax; now replace the wax surface against the vault of the plate and nicely adjust with the fingers. The tin must be securely burnished against the teeth. The lingual contour of the teeth is produced by roughly carving away the excess wax, with the Evans wax carvers just before placing the tin. The tin is also slit between the teeth on the lingual aspect and nicely burnished to place.

Tin foil number 4 is used for covering the cast. A sheet is fitted over the cast with thumb and finger. It is then removed and excess tin cut away with sharp scissors, as indicated by the imprint of the edge of the cast upon the tin. The cast is now coated with sandrac varnish, and when it has dried to tackiness the tin is at once replaced and firmly pressed and gently rubbed with a wad of soft paper until there is perfect adaptation to the cast. The tin should be rubbed until it has a well burnished surface. It is important that the tinned cast be coated with a lather of soap. If the soap is not applied the tin and vulcanite will adhere very strongly, and can only be separated by dissolving the tin with mercury or hydrochloric acid.

ESTHETICS.

Prosthetic dentistry has two exceedingly important essential sub-divisions: the mechanical and the esthetic. The mechanical refers to that part of the work performed in the laboratory, the esthetic to the harmonizing of our work or creation with its environment, or the art of concealing art. In order to practise prosthesis it is necessary for the patient to be under the inspection and study of the prosthetist, so that he can restore the lost form and harmonize the associate parts. To be an esthetic prosthetist the face must be studied carefully and the teeth must be set and colored accordingly.

No profession has more use for the esthetic and beautiful than that of dentistry. Proper form and color are the two essentials in the selection of teeth. The knowledge of the former can be arrived at by studying the outline of the face, following Dr. Leon Williams' method, grinding and coloring those selected to match the conditions found. In reference to color, if the color cannot be selected at the supply house the use of S. S. W.'s mineral stains will enable the prosthetist to color to suit himself.

We are told that as to contour there are three types of faces—straight, convex and concave.

Dr. Wilson, by means of lantern slides, showed us pictures of many celebrated persons, pointing out how the different faces fell into line with the above classification. He also used lantern slides to show us how beautifully the harmony of the features of the face had been restored to some of his patients by careful attention to esthetics.

Discussion of Dr. Wilson's Paper

DR. W. E. CUMMER, TORONTO.

IN opening the discussion, Dr. W. E. Cummer undertook to point out the immense amount of labor and expense involved in order to produce the scientific facts brought to the attention of the meeting, and also undertook to emphasize the practical importance of many of the conclusions reached by the essayist.

In offering comment upon the first two divisions of the essay, their importance was pointed out as such that the most scientific and mechanically accurate restorations de-

pended absolutely upon the correct manipulation of the materials, plaster and vulcanite. The speaker stated that he had been fortunate enough to have been using the larger proportion of the technique worked out by Dr. Wilson to the advantage of himself and his patients.

Regarding Spence's Plaster Compound, Dr. Cummer described a technique for full cases which he has found to be productive of results in forming metal bases far superior to anything which, in his knowledge, preceded it. The impression is made and the cast made in Spence's Plaster Compound. For a cast aluminum base the wax is carefully applied to the Spence Plaster Compound Cast, with rim, retainers, etc., and then half invested. This stiffens the wax in such a manner that it may be removed without distortion. The investment is then completed and the piece cast in aluminum. This casting being, from the inherent nature of the process, more or less inaccurate, the cast is placed on the original Spence Plaster Compound cast (in the meantime bedded in a ring supplied with the Ash press for the purpose) and the whole placed in the Ash swager, and the maximum pressure of the rubber blocks and finely divided rubber (next the model) applied producing a base, which, in the estimation of the speaker, is much superior to vulcanite and quite as accurate in fit and consequent adhesion, and little additional trouble. A soft metal "lift" may be placed between the casting and the Spence Plaster Compound cast before swaging for compensation of unusually hard areas in the median line. The technique for swaged metal base is very similar, the Spence Plaster Compound cast being used as a pattern from which the zinc or babbit cast is produced, and upon which the rough swaging is done, and the retaining wire, rim, etc., having been soldered, the whole is placed in the Ash press and reswaged similar to the cast aluminum process hereinbefore mentioned.

Commenting upon the last division, the speaker undertook to point out the importance, both from the standpoint of the patient and of the prosthetist as well, of restorations constructed upon harmonious lines with the outstanding characteristics of the patient, and concluded his remarks with congratulating the society upon its happy choice of both essayist and subject.

Discussion of Dr. Wilson's paper by Dr. I. H. Ante will appear in the next issue of ORAL HEALTH.

Importance of Posture

FRED J. SMITH,

Physical Director, Central Y.M.C.A., Toronto.

FAULTY posture is not purely a physical condition, though it is in some cases a matter of carelessness or imitation. It is in many cases, however, a reflection of physical, mental or moral condition, as may be seen by comparing the characteristic attitude of the ill with that of the well; of the coward with that of the brave man; of a sneak with that of a frank, honest man; of one ashamed with one who has nothing of which to be ashamed. The desirable attitude is with erect carriage, full chest, chin in, head up. The "slouch" is the characteristic attitude of the discouraged and the "down and out." Psychologically, to continue in a poor posture encourages the development of the conditions shown by such posture and these may eventually become permanent. Thus, since physical position reflects and indicates physical, mental and moral condition, it is quite evident that forcing a correct attitude will help "ward off" illness, "the blues," discouragements, etc., and provide a way for growth in those qualities for which correct attitude stands. Correct posture is much more a matter of ambition and inspiration than it is of exercise. Once secured it must be persisted in during all the activities of the day.

The simplest method of assuming a correct standing position is that with the toes and chest against a wall and the abdomen and nose a couple of inches back. This means that the weight of the body is carried on the balls of the feet with the line of the centre of gravity running just in front of the ankle, behind the centre of the knees, through the hips and shoulder. Many dentists fail to properly adjust the operating chair and get the bad habit of stooping at their work. This should be carefully avoided.

Though good posture is largely a matter of ambition expressed, yet exercise will help. Several things are to be remembered:

- 1st. That the position one assumes most is liable to become permanent.
- 2nd. That it is the duty of muscle to pull and not push.
- 3rd. That muscle shortens if used much to complete con-

traction. Therefore vigorous exercise in and to the right position is helpful.

We emphasize in our classes as follows:

For protruding chin and head forward.

Such exercise as head bending backward with or without pressure from the hands; also lying on the back, arching from back of head to hips and later to heels (bridging).

For round shoulders.

Such exercise as moving the arms sideward from the front horizontal; arm flinging sideward; raising of the chest; various arch stands; lying on the back; arching from head to hips and heels.

For Low Shoulders.

Lifting or shrugging of low shoulder.

For Large Waist.

Lying on back, various thigh flexions. Later with feet held down, rising to sitting position.

However, it is most important for one to watch one's position (standing, sitting and walking) throughout the day. When bending forward, bend at the hips instead of at the middle of the back. When sitting, have the lower back against the back of the chair. Do not lean on your liver and stomach.

The shoulder-girdle is constructed to permit the widest range of movement with the utmost lightness of structure, but the pelvic girdle, whose chief office is that of support, is firm and arch-like with powerful ligaments, heavy bones, and scarcely perceptible movement. The entire weight of the head, neck, upper extremities and shoulders hangs upon the flexible and growing spine during the standing and sitting positions. The muscles that steady the spinal column rapidly become fatigued when thus kept on the strain, and allow the shoulders to droop forward, bending the neck and back with them. The resulting deformity is called stoop shoulders, slant shoulders, round back, faulty attitude, kyphosis, or bowed back, and when the deviation is to the side, either right or left, it is known as scoliosis or later curvature.

The condition of round shoulders can be determined only after the normal standing attitude is clearly defined in the mind, and deviations from this normal attitude can then be noted and accurately described. Antero-posterior deformities may be classified as round back, round hollow back, and forward displacement of the shoulders.

The causes of round shoulders are those general conditions that produce muscular or constitutional weakness, like

rapid growth, overwork, bad air in schools or home, acute illness, myopia uncorrected by glasses, poor hygiene at home, or general lack of exercise, and secondly, occupations that demand long-continued flexion. Among these may be mentioned the use of ill-fitting school furniture, long-continued writing and drafting or work with the microscope; in fact, the requirement of any fixed position for more than a few minutes at a time in a young child. His restlessness in school is his only means of protest, and is then the object of much misapplied correction by those school teachers who believe that quietness and goodness are synonymous. The third cause, more direct than either of the others, is the wearing of clothing supported by suspenders bearing on the points of the shoulders, tending to pull them downward and forward or even to produce a painful deformity of the scapula. A few exercises are suggested:

Exercise 1.—Patient standing in his habitual faulty position. Place hand about one inch in front of the sternum, and tell him to raise the chest and shove it forward to touch the hand without swaying the body. In doing this at first he will try to draw the shoulders back, contracting the trapezius and rhomboids. This fault must be overcome at the very beginning, and the shoulder muscles must be kept relaxed. Gradually increase the distance to which he can bring the chest forward, repeating it again and again until he can take the position without difficulty and without contracting the muscles of the back. While in this position make him breathe deeply five times and then relax. This should be done before a mirror, so that he will recognize the feeling of the correct posture and associate it with the proper attitude, as seen in the glass. He should then try to take it without looking at the mirror. This posture should be drilled into him until it becomes habitual, and until he can maintain it without discomfort.

R. J. Roberts, of Boston, is accustomed to tell his young men to press the back of their neck against their collar button, considering this as the keynote of the position. In whatever way it is accomplished, the object is to get the proper relation between the thorax and the pelvis.

After repeating Exercise 1 twenty times, take Exercise 2.

Exercise 2.—Arms forward raise, upward stretch, rise on tip-toe, inhale, sideways lower, slowly press the arms back. Exhale.

This exercise, when done correctly, expands the chest,

bringing in all the extensors of the back and the levators of the shoulders.

Exercise 3.—Patient standing, arms down and back, fingers interlocked and palms outward. Extend the neck, roll the shoulders back and forearms into supination, the palms being first in, then down, and then out. Reverse to starting position and relax.

This exercise is particularly valuable for projecting the chest forward, stretching the shortened ligaments, and drawing in the abdomen. Care should be taken to have the chin pressed backward when the arms are brought downward and turned outward. In resistant cases, where this exercise cannot be done with the fingers interlocked, a handkerchief tied in a loop may be substituted and held in the fingers.

Exercise 4.—Patient standing with the arms at the sides. Arms sideways raise, upward stretch, inhale, forward bend, and rise. Arms sideways lower. Exhale.

In this exercise the lungs are filled when the chest is in the most favorable position for expansion. The breath is retained when the trunk is flexed, forcing the air into the cells of the lungs under pressure. The bending and rising bring into powerful action the extensors of the back and neck and the retractors of the shoulders.

Exercise 5.—Patient lying prone upon a couch with the feet strapped or fixed by an assistant. Hands clasped behind the head. Raise the head and extend the spine, pressing the elbows backward. Relax.

This exercise is a severe one on the extensors of the back and the retractors of the shoulders.

Exercise 6.—Patient lying in a prone position, arms at the sides. Raise the head, bringing the arms forward. Imitate the breast stroke in swimming.

In this exercise the erector spinae is kept in static contraction, while the retractors of the shoulder are alternately contracted and relaxed.

Stretching exercises that require the services of an assistant or a machine designed for the purpose should be associated with these voluntary movements. Sylvester's method of artificial respiration may be employed with good effect, the upper dorsal region being supported by a hard pillow, the surgeon pulling at the end of the upper movement, stretching the thorax to its utmost. The intercostal machine is invaluable for securing the same kind of movement. Zander's machine, the "tower" straps the shoulder

backward and forces forward the rest of the body, imitating closely the movement and rhythm of ordinary respiration. The quarter-circle is another gymnastic machine designed to give breathing exercises, with the body held in an over-corrected position. Taylor's "spinal assistant" produces the same effect by suspending the weight from the arms with accented pressure on the dorsal region, either from behind, forward or laterally.

R. C. D. S. Freshmen Class '02 Reunion

533 St. Clair Ave. W., Toronto, Ont.

TO the Members of the Class:

At the annual meeting of the Ontario Dental Society, held in February last, a number of the Graduating Class of '05 and '06, or more properly speaking, the Freshman Class of the Session of '02-'03, were in attendance. At the noonday luncheon (which was a feature of the convention on the second day) the men of the '02-'03 Freshman Class sat down at one table and enjoyed a very pleasant hour.

At this time, one of the number suggested a class reunion, to be held in Toronto simultaneously with the O. D. S. meeting in 1915. The "suggestion" was well received by all "the boys" present, and consequently Dr. H. A. McKim and your humble servant were informally appointed to act as Chairman and Secretary respectively (pro tem), and instructed to arrange for an informal dinner at which all the '02 class in or near Toronto might assemble to perfect plans and appoint a permanent committee to complete arrangements for the reunion.

We met late in March in "The Little Blue Tea Rooms" on Yonge St., and got a foretaste of what a bumper gathering might do in turning the hands of the clock back to the good old days of the Dean's Hoodlums. At this meeting the following committee were asked and consented to act and do all in their power to make the reunion a howling success:

President—Dr. H. A. McKim, 68 Howard Park Ave., Toronto.

Secretary—Dr. N. S. Coyne, 533 St. Clair Ave. W.

Treasurer—Dr. Gerald Lewis T. Smith, 137 Annette St., Toronto.

Banquet Committee—Dr. E. A. Dolson, Dr. Alex. R. Jordan, Dr. Alex. Elliott.

Entertainment Committee—Dr. E. A. Grant, Dr. Margaret Gordon, Mrs. Kirk (nee Dr. Mildred Hanna).

Programme Committee—Dr. A. R. Stapells, Dr. Dick Hull, Dr. G. C. Phillips.

Clinic Committee—Dr. W. H. Doherty, and others.

Attendance Committee—Secretary, Dr. N. S. Coyne, Dr. A. M. Weldon, Dr. E. A. Wessels.

This will surely be a unique occasion, and it is hoped that every member of the class will make a special effort to be present and assist in making (to my knowledge the first occasion of this kind in connection with dental graduates) a complete success.

Arrangements are not yet complete as to entertainment and programme, but you will gather from the names of the committees appointed some of the ideas that will likely culminate in a reality.

1. A clinic by every member of the class that will consent to take part.

2. A banquet.

3. A theatre party.

It is also hoped that the members' wives will make a special effort to be present, as arrangements will be made for their entertainment as well.

This affair taking place as it does coincidentally with the O. D. S. meeting, reduced rates on all railways will prevail.

Further particulars will be sent in the very near future, but in the meantime plan to be here with "The Bunch" and let us forget our troubles with "plates that break eating soup" and molars with roots like the proverbial ram's horn—and let time turn backward to the days when nothing troubled us but Prof. J. J. McKenzie's reiteration of "Perforating Fibres of Sharpey" and the annual lecture fee.

The committee would be glad to hear through your Secretary that you are preparing to be on hand with the crowd, so that when the roll is called the number may be as complete as possible.

The Toronto dentists have organized a Rifle Club, so that you need have nothing to fear in the way of a German attack while in town.

N. S. COYNE, *Secretary*.

American Institute of Dental Teachers

THE Twenty-Second Annual Meeting of the American Institute of Dental Teachers will be held in Ann Arbor, Michigan, January 26th, 27th and 28th, 1915.

Preliminary reports of the various committees are most encouraging, and we believe that the essays, discussions and exhibits will be of unusual interest to dental educators of all departments. The Executive Board offers the following programme:

“Suggestions for Making the Dental Student a Better Student Dentist.” Dr. Arthur D. Black.

Symposium:

“Operative Dentistry.” Dr. A. H. Hipple.

“Prosthetic Dentistry.” Dr. Herbert L. Wheeler.

“Crown and Bridge Work.” Dr. A. J. Bush.

“Oral Hygiene and the Dental Curriculum.” Dr. N. S. Hoff.

“The First Chapter of Operative Technic Booklet.” Dr. D. M. Cattell.

The discussion of these papers will be participated in by eminent dental teachers from all parts of the United States and Canada.

The Commissions of Nomenclature, Text-books, Operative and Prosthetic Technics will present reports of interest to every college.

The Local Arrangements Committee has selected the hotel Annenel as headquarters for this meeting. Rates, one dollar to two and one-half dollars per day, according to location of rooms, bath, etc. Reservations should be made directly with the hotel management, except in the case of men expecting to be accompanied by their wives, who should communicate with Dr. L. P. Hall, who will make special arrangements for their comfort and convenience.

The date of our meeting has been published incorrectly in several of our dental journals, therefore, I desire to call special attention to the correct dates, Tuesday, Wednesday and Thursday, January 26th, 27th and 28th, 1915.

J. F. BIDDLE, *Secretary.*

PERSONAL PAGE

At the last meeting of the Grand Lodge of Canada, A. F. and A. M. in the Province of Ontario, four members of the dental profession were elected as District Deputy Grand Masters—Dr. W. C. Davy, Morrisburg; Dr. McQueen, Tillsonburg; Dr. G. C. Bonnycastle, Bowmanville; and Dr. N. Schnarr, Kenora.

Dr. V. Wescott and Dr. A. E. Clark will open new dental offices in Victoria, B.C., in January.

The many friends of Dr. A. J. Holmes, New Westminster, are very much pleased to see the doctor around again. Dr. Holmes had the misfortune to be accidentally shot by a companion while hunting.

Dr. T. B. Turner, Penticton, B.C., is the recipient of many good wishes from his friends on the event of his marriage on November 28th, 1914. Congratulations!

Election of Board of Directors, R. C. D. S.

IN the election of a Board of Directors for the Royal College of Dental Surgeons the contest in Electoral District No. 2, resulted in the election of Dr. M. A. Morrison, Peterboro, by a majority of 2 over Dr. O. A. Marshall, Belleville.

Dr. J. B. Willmott was re-elected as representative from the Faculty of the School of Dentistry.

The Board for the ensuing term will be: Drs. W. C. Davy, M. A. Morrison, W. C. Trotter, Donald Clark, W. M. McGuire, Chas. E. Sale, H. R. Abbott, J. B. Willmott.

MULTUM IN PARVO

This Department is Edited by C. A. KENNEDY, D. D. S., 2 College St., Toronto

Librarian, Royal College of Dental Surgeons of Ontario

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS
OF THE PROFESSION, WILL BE GREATLY APPRECIATED BY THIS DEPARTMENT

POLISHING ARTIFICIAL VULCANITE DENTURES.—After having filed and scraped a vulcanite plate, instead of using any sandpaper, a mixture of one part of emery powder and three parts of powdered pumice is employed for finishing and polishing, affording considerable economy in time.—*Le Laboratoire et le Progres Dentaire (Dental Cosmos)*.

TO MAKE CORKS FIT.—Now and again the only cork at hand large enough is too large, with no cork presser available. By boiling for five minutes the cork can be made to fit perfectly.—*Country Gentleman, per Dental Brief (Dental Cosmos)*.

NEW MATERIALS FOR CASTS.—Clean trays and dip them into a pan of hot wax; then hang them up to dry. This will give the trays a thin coating of wax. Take impression in the usual manner and remove plaster from the tray by heating it over flame. Dip tray in wax solution again and hang it in place for future use. This will insure bright, clean-looking impression trays.—*E. Eustice, Dental Review*.

REMOVING THE ODOR OF IODOFORM.—The odor of iodoform may be removed from the hands by the application of mustard. The hands are moistened with cold water, a small quantity of dry mustard is placed in the palm, rubbed well over the hand, and washed off with soap and water. The odor can be removed from utensils in the same way, with the exception that the mustard paste should be allowed to remain on for several hours.—*The Hospital, per Monthly Cyclopedic and Med. Bulletin, Dental Cosmos*.

EMERGENCY REPAIR OF A BROKEN VULCANITE DENTURE.—A temporary emergency repair of a broken vulcanite denture, to tide the patient over it until it is convenient to repair it properly, may be effected in the following manner: With a small rose-head bur in the engine a row of holes is drilled on each side of the break one-eighth of an inch apart, and one-eighth of an inch from the edge of the fracture. The two pieces are then laced together with waxed floss silk or any strong thread, affording a surprisingly strong joint.—*H. S. Taylor, Australian Journal of Dentistry, Dental Cosmos.*

A GOOD FLUX.—Fill a bottle with as much water as you think you want flux. Pour this water in a glass and place latter in a pan of water; fill the water in the glass with as much borax and boracic acid, equal parts, as the molecules of water will hold; let water come to a boil and cool; pour same into original bottle and you will have a clear flux.—*Wm. V. Sher, The Dental Review.*

DON'T LET COVERS STICK TO SANDARAC BOTTLES.—To prevent the covers of the office preparation bottles containing shellac and sandarac from sticking, spread a thin coat of vaseline on the ground surfaces at their necks. This prevents the shellac or sandarac from adhering to these surfaces; it also prevents the covers from sticking to the bottles and making them difficult to remove. Be sure and clean them at the points mentioned before applying the vaseline.—*F. E. R., The Dental Review.*

TO REMOVE BLOOD STAINS.—To remove the blood stains from white clothes, pour some H_2O_2 on the spot and wipe it off with alcohol.—*Michael Diratsouyan, Smyrna, Turkey in Asia.*

DEVICE FOR HEATING RUBBER.—Try a piece of clean paste-board instead of a metallic cover to warm rubber on and you have no sticking.—*J. C. Rice.*

REPAIRING RUBBER PLATES.—The old methods of dovetail cutting, grooves, holes, etc., are entirely unnecessary. Cut out all the old rubber, and with a hot spatula pack in new against a clean-scraped surface.—*Dr. L. P. Haskell.*

IODINE STAINS.—Should, through any accident, iodine stains get on the linen of the patient while in the chair, the application of hypo, or fixing solution used in developing, will cause prompt removal.—*Journal of the Allied Dental Societies*.

ARRESTING HAEMORRHAGE FOLLOWING EXTRACTION.—In post-operation bleeding a tampon of cotton saturated in a five per cent. solution of iodine in chloroform is introduced into the empty alveolus, inducing prompt arrest of the hæmorrhage.—*The Dental Register*.

TO PREVENT SLIPPING OF ENGINE CORD.—When your engine pulley becomes worn so that the cord inclines to slip upon it, fill the bottoms of the grooves with unvulcanized rubber and note benefit.—*V. C. Smedley*.

FORMULA FOR SENSITIVE DENTIN.—Zinc chlorid, 20 grains; 4 grams each of alcohol and chloroform. This is not a panacea for all cases, but in large cavities, in molars and bicuspsids, which approach the pulp, its use is very gratifying. In this formula the irritating property of the zinc chlorid is controlled by the chloroform, the alcohol being necessary to effect a solution.—*Elmore W. Elliot, The Dental Review*.

METHOD OF RENDERING CEMENTED SHELL CROWNS EASILY REMOVABLE.—Before cementing a shell crown to place give the inside a thin coating of chloro-percha. If at any time it is necessary to remove it, all that is required is the application of heat, and the crown can be easily removed.—*Dr. Cordaux (New South Wales), in Australian Journal of Dentistry (Dental Record)*.

GOOD SOAP.—One of the most gratifying things a dentist can have is a good soap, which after using many times a day, does not leave the hands in a dry, cracking condition. This is prepared by putting five pounds of U. S. P. Green's soap into a five quart plaster pail, fill with water, boil for twenty minutes and let cool slowly. Do not add alcohol for clarifying, but let stand for a few days when the clear amber colored solution can be syphoned off. This is the most satisfactory soap for our purposes that I know of.—*A. G. Loomis, D.D.S., Chicago, Ill., Dental Review*.

Oral Hygiene Reports

St. Louis, Mo.

The St. Louis Times recently published the statement that Dr. Wylie, Pure Food Expert, in celebrating his seventieth birthday boasted that he felt as fit as though he were forty, and attributed his excellent condition to the fact that he had good teeth.

The editor of the *Indianapolis Times* in commenting on this statement, expressed the view that "The average individual could keep his teeth in sound condition for as little as \$100 during an entire lifetime, if he began early and paid consistent attention to the matter. The big bill with the dentist usually results from the process of putting off simple duties; the postponement of little tasks until they become large tasks.

"And it does not seem improbable that we are arriving at an era when the prompt attention to defective eyes and teeth may be regarded as one of the proofs that the forces of civilization are bearing us along with them."

Washington, D.C.

Declaring that bad teeth are worse than smallpox, and that more lives are wrecked by them than by the disease, Dr. Harvey W. Wiley, Pure Food Expert, yesterday morning, in an address at the formal opening of the free dental clinic at the Pierce School, advocated the passage of a law forcing school children of Washington to have their teeth kept in perfect condition.

The opening of the free clinic is the first venture of the kind in Washington, and it is the hope of the National Capital Dental Society, and other dental surgeons fostering the idea, that eventually Congress will appropriate funds for the establishment of four such institutions in the schools.

The clinic was established through the efforts of the National Capital Dental Society and a number of other dentists.

Burlington, Iowa.

A meeting of physicians was recently reported, where the discussion of the relationship between the teeth and cancer occurred.

Constant irritation of any part of the body is now well recognized as an important contributory cause of cancer. One of the forms of irritation which has been repeatedly observed to result in this disease is the constant friction of the sharp edges of teeth or of imperfect plates against the sides of the tongue. To be sure, sores on the tongue caused in this way do not always become cancer. Neither are wounds from toy pistols always followed by lock jaw. But there is danger in both cases, and it is as easy to avoid it in the one as in the other. A bad tooth should never be tolerated in any event, and the danger of cancer is only one more good reason for having it attended to.

Dallas, Texas.

The Infants' Welfare and Pure Milk Association will establish a Dentistry Branch of its work at the station at Trinity Play Park as soon as arrangements can be made. The announcement was recently made at a meeting of the Board of Directors of the organization at the office of the president.

Dr. John W. Embree was appointed to arrange for the apparatus for the dentistry branch. Services of Dallas dentists will be given to applicants of the station.

North Carolina.

The North Carolina State Board of Health held a meeting recently at which two members of the State Dental Association made representations in behalf of oral hygiene and its relationship to good health.

Cleveland, Ohio.

Myron J. Jones, for a number of years Director of Education of the Washington Y. M. C. A., has taken up the work of Director of the National Mouth Hygiene Association.

Kansas City.

Representatives of the local auxiliary of the National Mouth Hygiene Association appeared before the board of education last night asking permission to install a system of inspection in the public schools. The use of a building for the holding of clinics was also requested.

The committee, which consisted of Dr. Thomas B. McCrum, Dr. W. J. Brady, Dr. E. M. Hall and Prof. M. J. Patterson, said that the movement had been indorsed by the Kansas City Dental Society. Doctor McCrum explained that many diseases were contracted through the mouth and neglect of the teeth. Literature calling the attention of children and parents to the need of proper care of the teeth will be distributed in the schools. The Board of Education referred the matter to Prof. I. I. Cammack, Superintendent of Schools.

Chicago Dental Society

THE annual meeting of the Chicago Dental Society will be held in Chicago on January 29th and 30th, 1915, at the Hotel La Salle. On Friday papers will be read and Saturday devoted to clinics. The annual dinner will be held on Saturday evening.

Canadian dentists who are planning to attend this convention and are willing to give clinics should send their name and a description of clinic to Dr. D. C. Bacon, 31 N. State St., Chicago. President Grisamore and the other officers of the society are making every effort to make this meeting a great success.

Chewing Gum

SINCE the wave of extensive gum chewing has swept the land, more dyspeptics have been created than from all other causes, the only exception being bad cooking. Makers of chewing gum know this, and therefore put the loud pedal on the false allegation that "chewing prevents and cure dyspepsia."—*Health Bulletin*.

ORAL HEALTH

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A Monthly Journal devoted to the furtherance of individual and community health by the advancement of Dental Science and Oral Hygiene.

Published in the hope that it may reach those with an open mind, a willing heart and a ready hand to serve.

SUBSCRIPTION PRICE - \$1.00 PER YEAR.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, 229 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to the Publishers, Oral Health, 229 College St., Toronto, Canada.

Vol. 5

TORONTO, JANUARY, 1915

No. 1

EDITORIAL

A Personal Word

WITH this issue ORAL HEALTH enters upon its fifth year of publication. Many of our readers have been subscribers to the journal from its inception, and we are thankful to these old friends who have been so loyal and have given such generous support even when it has been little deserved. The cares and difficulties incident to the publication of a monthly magazine are many, but the work is undertaken gladly when back of the project is the loyal support and kindly interest of so many members of the dental profession. The editors are very grateful for evidences of appreciation, and enter the new year resolved to give to dentistry an even better journal than has been possible heretofore.

Our advertisers are also entitled to our sincere thanks—and by “our” we mean *your* advertisers as well as *ours*. It is the advertiser who makes it possible for us to send you ORAL HEALTH twelve times in the year, for one dollar. The actual cost of printing the magazine is more than twice the

subscription price. The magazine could be printed more cheaply, but we have always aimed at producing a book that would do credit to dentistry. Add to the cost of printing, that of postage and office expenses, and one can see at a glance that the subscription price pays but a comparatively small part of the total cost of production. The daily press, as well as monthly magazines, are made possible (at their present selling price) by those who advertise. For a single penny or less we receive the news of the world delivered to our door. It isn't our penny that pays the price. It's the advertiser's dollar.

But there is abundant evidence that the advertiser gets a *quid pro quo*. Whatever may be said of regular magazines the advertising pages of dental magazines are certainly read by the dentist. Indeed he frequently glances through the advertising pages first of all, and then lays the magazine aside that the reading pages may be gone through at a more convenient time. We have no objection so long as the "more convenient time" materializes, and it will be our constant aim to make the reading pages of ORAL HEALTH so readable and so helpful that every copy will not only be carefully read, but saved to be later bound into a library volume for future reference.

Dr. G. C. Bonnycastle—Dr. W. J. Bruce ***An Appreciation***

DURING the past eight years, Dr. W. J. Bruce (Kincardine) and Dr. G. C. Bonnycastle (Bowmanville), have served the dental profession in Ontario faithfully and well as members of the Board of Directors of the R. C. D. S. Both of these members are retiring from the Board this year and have certainly earned the gratitude of the profession through the very excellent service they have rendered. Few members of the profession fully appreciate the important work accomplished by this Board in its direction of dental affairs in the Province of Ontario.

In the administration of such an important trust many difficult problems have to be constantly met, and their solution is not always easy, nor along the most pleasant paths. Yet it may be truly said of Dr. Bruce and Dr. Bonnycastle that they never shirked a duty, and they are retiring from

the Board with the good will and sincere regard of the entire profession.

Dr. and Mrs. Bruce have taken up their residence in Los Angeles, California, and we but express a general wish in sincerely hoping that Mrs. Bruce may be so improved in health that she and Dr. Bruce may, in the very near future, be again numbered among the residents of their home Province.

Dr. Bonnycastle has had such wide experience upon the R. C. D. S. Board, it is to be hoped that his services may, at some future time, be again available to his Alma Mater.

Ontario Dental Society

THE next annual meeting of the Ontario Dental Society will be held in the College Building, Toronto, on Monday, Tuesday and Wednesday, May 10th, 11th and 12th, 1915. Dr. W. E. Harper, of Chicago, will give an essay on "Amalgam," which will be further augmented by two clinics. The programme committee is endeavoring to secure the services of some capable men to present the subjects of "Root Canal Treatment" and "The Treatment of Children's Teeth." Further notice will be given through ORAL HEALTH as arrangements for the programme progress.

Municipal Dental Clinic

THE Toronto Municipal Council at a recent meeting, provided the necessary funds for the establishment and maintenance of the two extra clinics recommended by the Board of Health for the Toronto General and Western Hospitals. These clinics will be under the supervision of Dr. Bothwell.

DENTAL PRACTICE FOR SALE.

Good central city dental practice on a transfer corner. \$500. Office rent \$30.00 per month. Apply to ORAL HEALTH for particulars.

In Memory of William H. Doherty

'Tis held that sorrow makes us wise;
Yet how much wisdom sleeps with thee
Which not alone had guided me,
But served the seasons that may rise;
For can I doubt, who knew thee keen
In intellect, with force and skill
To strive, to fashion, to fulfil—
I doubt not what thou would'st have been:
A life in civic action warm,
A soul on highest mission sent,
A potent voice of parliament,
A pillar steadfast in the storm.

Tennyson's "In Memoriam"

WILLIAM H. DOHERTY, of Toronto, was one of the great men of dentistry, whose place will be most difficult to fill. His passing has occasioned his many friends the deepest sorrow, and cast a shadow upon the entire profession. Though but a young man, his record of service was abundant.

Dr. Doherty's name will always be associated with the organization of dental clinics in the public schools of the City of Toronto, he having been in charge of this work from its inception. In his college work, as professor of dental anatomy, he was loved and admired by students and members of the faculty alike.

The writer has suffered a great personal loss. In addition to close association in the editorial work of *Oral Health*, there has been an even more intimate relationship in dental practice, resulting in the strongest bonds of friendship and esteem.

As a citizen and a dentist, Dr. Doherty had varied and important interests, yet his first thoughts were always of his home. The sincere sympathy of the dental profession goes out at this time to Mrs. Doherty and family.

The knowledge of such a life of service and achievement will be a great comfort to the bereaved ones, and an inspiration to others.

WALLACE SECCOMBE.



THE LATE WILLIAM H. DOHERTY, D.D.S.

Born at Blenheim, Ontario, 24th October, 1883

Died at Toronto, Ontario, 17th February, 1915

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION" AS WELL AS THE "POUND OF CURE"

VOL. 5.

TORONTO, FEBRUARY, 1915,

No. 2

*Emetine Treatment of Pyorrhea Alveolaris**

GUY R. HARRISON, PH.M.B., D.D.S., RICHMOND, VA.

THE work of Barrett and Smith, Bass and Johns of America and Chiavaro of Italy has opened up a great field of work. Their researches along the line of protozoa of the mouth has, I believe, given us a far greater insight into the etiology of pyorrhea than we have had before. The fact of finding the *Endamoeba Buccalis* present in nearly every case of pyorrhea certainly is a thing to be considered.

The investigators do not claim that the *Amoebora* is the cause of all cases of pyorrhea, and Barrett recommends microscopic examination of the pus pockets, before and several times during treatment. The technique of this is simple: Use a small flat scaler; first flush off the necks of the teeth with water syringe, but do not go into pockets. Remove a small amount of contents of pocket, taking care not to wound the soft tissue, as this would cause blood to get into specimen and make harder the identification of the parasite; dilute specimen with warm salt solution, and deposit on warm cover glass; smear a very small amount of vaseline around edges of cover glass, place on warm side and examine. Examination of the fresh, warm, unstained specimen is the best manner of examination, as one can then see the amoeboid movement.

It is absolutely necessary to keep the specimen warm, or at body temperature; this is best done by the use of a warm-

*Read before the Richmond, Va., Dental Society.

ing stage on microscope. The parasite varies in size from six to thirty micromillimeters, is a gelataneous-looking cell, and projects only a few pseudopods at a time, usually two. Their size and movement makes finding them rather easy, after one has located them enough to be familiar with them.

At the present stage of development it is to be recommended that emetine be used only in those cases in which the endamoeba is found.

Emetine, the active principle of ipecac, was suggested for treatment, as it is a known amoebicide and a specific for amoebic dysentery.

Barrett suggests the following method: A 1/2 of one per cent. solution of the drug is introduced into the pockets, care being taken to reach all portions of the pocket; fill pocket as needle is withdrawn. He also states that he thinks it a good practice to apply solution around fixed appliances, and into interdental spaces.

Treatments should be repeated daily for at least five days, and every other day until ten treatments have been made. The number of treatments would, of course, be governed by the clinical findings, and microscopic examinations. Bass recommends the following method: Hypodermic injection daily of 1/2 grain doses of the drug for a period of from three to six days.

The best results I have obtained from a combination of both methods.

The drug is put up by "Lilly," in ampoules of 2 c.c. of 1/2 of 1 per cent. solution, and one c.c. containing 1/2 grain of drug. This method of using emetine is to be preferred to using tablets. The combination of the two methods I referred to is, use the 1/2 of 1 per cent. solution for injection into pockets, dry mucous membranes, put in cotton rolls and saliva ejector, use glass syringe and platinum point, as this allows sterilization in open flame after withdrawing from one pocket and before carrying it into another.

Fill pocket well with solution and with sterile vaseline, applied with tooth pick, cover pocket; this will retain solution in pocket longer than if it were left open. I see the patient daily for three days, give the above treatment, and also administer 1/2 grain of emetine hypodermatically. Do not see the patient on the fourth day, but the fifth, sixth and seventh day the above treatment is repeated. On the third day curettage and polishing is begun, doing a little at each

sitting in order not to cause any more tissue lesions than are necessary.

Care should be taken not to allow patient to swallow any of solution, as it, even in minute doses, might cause emesis if taken into stomach. The results are checked up by microscopic examination at least once during the course of the treatment, and if endamoeba are found treatment may be extended over the six times.

The flow of pus usually ceases after the second treatment. In persistent cases Barrett recommends the adjunct use of iodine.

Fixation of Loose Teeth.—This is a much-mooted question, but there is not the slightest doubt in my mind that this practice has in the past been followed too much.

Technique of Hypodermic Administration of Emetine.—Have syringe and needle sterile, swab point of injection well with tinct. iodine. Wipe iodine off with ethyl alcohol. I might mention that the point of injection does not matter. The arm is the most convenient point; inject subcutaneously and at a point where is the least muscular movement.

The local reaction is not marked by any means, no more so than is the injection of any alkaloid. There is no doubt in my mind but that pyorrhea is a local condition, but, of course, systemic disturbances and complications arise, such as the various forms of arthritis, gastric disturbances, various forms of nephritis, and diseases of circulatory system, anemias, etc. These conditions demand treatment and should bring about better co-operation between the general practitioner and specialist.

The following conclusions drawn by Riethmuller are of a good deal of interest:

1. The endamoeba buccalis occurs encysted in the oral cavity, hence does not represent merely a transitional stage of other endamoeba, but an independent form.

2. The endamoeba is found in the pus of all cases of pyorrhea alveolaris.

3. It is generally present in the soft deposits upon sound teeth which are not kept in good hygienic condition.

4. It is not found in carious cavities in which the pathological process of decay is actually going on, and which therefore represent an acid medium.

5. It is absent in hard tartar.

6. *The endamoeba has no pathogenic action; on the contrary, as it feeds on bacteria, it is most probably an adjutant in the autodisinfection of the mouth.*

No. 6 is explained by Bass by the statement "There is a seeming symbiosis between the endamoeba and the bacteria."

The profession owes a great deal to these men for their research work, and we ought to aid them in every way, such as the taking of accurate written histories of cases, etc. The writer is now working along the lines of blood and urine examinations in these cases.

In examination of cases *do not press upon soft tissue* over pockets; one who does this puts pressure upon an infected area and certainly is not familiar with pathology.

Discussion of Dr. Harrison's Paper

DR. B. T. BLACKWELL reported a limited experience in the use of emetine, having treated but one case. Microscopic examination revealed amoeba present. Used Parke-Davis emetine.

Dr. G. R. Harrison reported treatment of five cases. Carefully followed the Bass technique. Found amoeba in two cases. He thinks amoeba was present in all cases. In first case used $1/4$ gr. 2 cc. in distilled water, giving three $1/4$ doses for three consecutive days. Skipped fourth day and reinjected fifth day. Result: reduced pus. Case 2.—Case of three years' duration. Injected $1/2$ gr. with 1cc. solution emetine. Less irritation locally, but this is not important to treatment. Fifth day pus was decreased; seventh day free from pus. Organism is not pathogenic. Investigation does not claim organism to be the cause, but associated with pyorrhea. Irrigation of pockets is the best way. Physicians are using the treatment commonly throughout the city where they have difficulty in their diagnosis with the patient, or where they are not responsive to other treatment. The result is likely to be unfortunate for emetine, since this must be a stab in the dark. Dr. Bass thinks that the amoeba and whatever organisms are present, pus, etc., that the amoeba penetrates the tissues first, followed by the associated organisms.

It is important that a microscopic examination be made in each case; treated otherwise, we are stabbing in the dark. A blood count is also important. After irrigating and flushing out pus pockets, drag across the top of each pocket some vaseline on a tooth pick. This protects the application for a short time.

Dr. Sheppard, bacteriologist at Memorial Hospital City, and Dr. J. M. Lewis reported three cases. Amoeba found microscopically in two of these cases. Case 1.—Case of fifteen years' duration. Irrigated with fluid extract of ipecac. Sprayed pockets several days. Hypodermic injection in arm three successive days 1/2 gr. emetine daily. Prescribed two drops fluid extra of ipecac as toilet. Result: bleeding of gums disappeared. Case 2.—Acute pyorrheal abscess. First irrigated with fluid extract of ipecac, followed by six injections of 1/2 gr. emetine daily in arm. Abscess disappeared and general condition of the mouth improved. Remarkable feature in this case was the complete disappearance of an eruption on the legs and chest, of several years' duration, which never before had responded to any treatment of any kind. Apparently eczema. Bleeding of the gums ceased. Case 3.—Treated several times before for pyorrhea. Four injections hypodermically in arm, followed by irrigation, 1/2 Lilly's ampoules. Pus disappeared. Thorough scaling of teeth was followed in each of these cases. Apparently no systemic trouble in any cases.

Dr. R. L. Simpson did not believe that emetine was necessary. Could get complete recovery of any case without anything but a careful technique in removing deposit. Relied upon the completion of surgery at one sitting. The blood clot protecting area an invaluable aid if cleanliness was carried throughout operation.

Dr. W. H. Street was very much interested in emetine, but did not care to report on his findings. He felt a little towards it as he did for a preparation made by a local druggist. The druggist claimed that he had something that would, if you took one of his No. 1 tablets before meals in conjunction with one of his No. 2 one-half hour after meals, dissolve any deposit in the mouth.

Dental Treatment for British Soldiers

THE Under-Secretary for War, replying in the House of Commons to an enquiry as to the provision made for dental treatment of soldiers, said: "I am aware, of course, that defective teeth are common amongst recruits as amongst other categories of persons. General officers commanding are already empowered to spend money on any man's teeth to fit him for service. A large number of dental

surgeons and dental institutions have patriotically arranged to treat, free of charge, recruits who would otherwise be rejected on account of their teeth. I gladly recognize what has been done in this respect. Finally, dental surgeons are being appointed to all the larger military stations at home. They will devote their whole time to work with the troops.”
—*Dental Record*.

Analgesia With N₂O and O

F. C. HUSBAND, D.D.S., TORONTO.

TO successfully give analgesia we must first of all study to have a manner that impresses our patients. We must have an optimism that is born of good health. We must take plenty of exercise, rest and a periodic vacation to prevent “staleness.” We must inspire confidence. To this end, it is perhaps well to give a description of what the method is, what effects are to be experienced, and especially that nothing is forced on them; but that they must do the taking—breathing in more of the gases should any soreness be felt. This all helps to allay fear and to produce a calm which is so necessary to success. The safeness of the treatment may be emphasized, also the fact that the patient is in control of the administration, as it were—taking it himself in just a sufficient quantity to make him comfortable and immune to pain.

The condition of the patient is important. If he be bilious, and you know it, have him return a day or so later when a physic will have corrected the condition. If possible, have the administration some little time after a meal—late in the morning or afternoon—though this is not absolutely necessary.

See that all tight clothing is loosened and request the patient to empty the bowels and bladder if there is a desire to do so.

The position in the chair is the next step to consider. Have the back sloping about 45 degrees, the bottom of the back rest high enough to clear the hips. Have the patient sit right back so that the back is supported, and feels comfortable. Have him then hold his head in a position comfortable for reading a newspaper, and while in this position bring the head rest to within a couple of inches of his head, where it will support him at the upper part of the back of the head when he lets his head back. Have him fold his hands in his

lap. Enquire if he is perfectly comfortable, and if not, do any slight adjusting to make him so. Tell him to try and feel tired and lazy—to relax.

Have the room warm. See that the patient's hands are warm. If they are cold, find out the reason. If it be from fear, refuse to administer and endeavor to rid him of his fear. Put a warm rug over his knees and hands and feet and get him warm. If he is merely cold from coming from a cold atmosphere, this will warm him up.

Fear and nervous anxiety are usually dispelled by giving the patient 10 grains of Bromural one hour before administering, followed by another 10 grains half an hour after first dose. Instruct patient to take at least half a glass of water with each dose. Paraldehyde—1 drachm—which acts in 15 minutes, is useful. It has no toxic effects. It is an agent used in insane asylums.

Having adjusted the apparatus on the head and nose, with the valves wide open, instruct the patient to breathe quietly through the nose, keeping the eyes open. Allow the gases to run into the bag of the machine—to slightly distend it—and when the patient begins to smell them close the air valve and, standing by your patient, speak in a soothing tone and quietly encourage him and enquire from time to time if he is feeling symptoms which you know he may experience. Ask him if he feels the warmth, if he feels the tingling sensation. Get him to snap his teeth and ask him if they feel numb. Get him to touch his centrals. If he cannot without fumbling you may begin operating. The touch of the bur must be gradual and will be the final test of his condition of analgesia. Note the huskiness in the voice.

The percentage of oxygen to start with is usually 10 per cent., raised to about 20 per cent. for continuing the operation. Always use sharp instruments. A dull instrument should be shunned. Heating up of a bur should be avoided, as it will create pain short of anesthesia.

While operating use "please" and "thank you" to your patient. Flatter him. Remember he is in the stage of intoxication and is feeling happy. Use short sentences which elicit "yes" or "no." Suggest safety and comfort in your every word and action. You are addressing his subconscious mind and must expect that his answers will be slow.

Never suggest "Are you hurt?" Always use the positive, "You feel fine, don't you?" or a similar suggestion.

To prevent nausea, the following points should be observed:

First—Even administration of gases. Ascertain the patient's lung capacity and the mixture that suits him and keep to that.

Second—Avoid body strain by comfortable seating of the patient in the chair.

Third—Keep foreign bodies from back of throat by using metal saliva ejector and positioning head to prevent saliva from running back into the throat. Have patient clear throat occasionally.

Fourth—Prevent exertion in every way possible.

Fifth—As sights and sounds produce nausea, study to remove such causes. Sounds may be avoided by putting cotton in the ears.

Five or six inhalations are usually sufficient to produce analgesia. The alcoholic should be given very little oxygen, about 10 per cent. The same applies to the drug fiend and the hysterical patient. Children and elderly patients require larger percentages of oxygen.

A person with a bad cold or a nasal obstruction should not take the analgesic. The nasal inhaler is of little use to him in that condition.

Always be on the alert for indications of pain. A flicker of the lower lid is the first symptom, and the patient should be instructed to breathe deeply a few times. If that does not suffice, raise the percentage of N_2O , and, if necessary, increase the amount in the bag.

While operating always watch the effect of the analgesic, both as regards the patient's sense of pain and his general condition. Feel his hands from time to time to see that they are warm, and at the same time note his relaxation. If the hands remain cold under the rug it may be from fear and it would be useless to continue. Give him a sitting a day or so later.

When finished with the operation allow the patient to come out gradually by admitting air while the apparatus is still in place. Never bring him out with oxygen. You will make a sick patient out of the very best. However, if after he is well out and should complain of headache, some oxygen will usually clear that up, or Bromo Caffeine.

If you have nauseated your patient, the following method will most likely correct the trouble. Have him, while sitting, put the knees together, the arms being at each side of them and the body bent forward, press hard with both hands on

his back for a minute or so. This may be repeated. Aromatic spirits of ammonia may then be given 30 minims to a wine glass of water.

Do not allow your patient to leave your office while he is hot and perspiring from analgesia. Keep him out of drafts till he is cooled down. Always enquire how your patient is before dismissing him. Be sure he is feeling well and admits it.

The following facial colors should be observed and their indications noted, viz.: Rosy—Normal. Blue—Cyanosis. Green—Sick, nausea. White—Too much N_2O .

The following are the progressive stages in analgesia: Smell, taste, heat, speed, huskiness, numbness, loss of sense of direction.

Should a patient show signs of cyanosis a breath or two of pure oxygen will likely clear him up. Do not give the oxygen till the cyanosis disappears. Remember, it takes 30 seconds for the oxygen to complete its course in the circulation, and should we continue to give oxygen till the cyanosis clears we will have brought our patient out of the analgesia. Wait for 30 seconds for the effect after giving the breath of oxygen.

In conclusion, let me say that patience and perseverance along the lines suggested will bring results that are most gratifying to both patient and operator.

PLATE RETENTION.—The theory of the retention of upper dentures, especially in flat jaws, is not suction, but adhesion. The plate coming in close contact with the moist membrane, and not permitted to rest on the hard centre by use of a "relief," causes it to be retained.—*L. P. Haskell, Dental Review*.

FOOT OR ELBOW TAPS FOR THE WASH BASIN IN THE DENTAL OFFICE ESSENTIAL TO ASEPTIC PRACTICE.—When practicable, it is very desirable for the water supply to the wash basin in a dental office to be fitted with the hospital foot or elbow tap. This obviates the necessity of touching the tap with soiled fingers, and prevents the passing infection or dirt from one patient to another.—*B. Corbett, Commonwealth Dental Review (Dental Cosmos)*.

PRACTICAL SUGGESTION.—A good way to keep the little novocaine billets handy for use is to put them in capsules, such as are used to hold Canfield's gutta percha points. Much better than the long, thin bottle, as you can get one out at a time.—*Harry D. Lyon, Dental Review*.

The New Gospel of Health According to the Dentist *

BY HAROLD CLARK, D.D.S., TORONTO.

IN choosing dentistry as a profession, I had many misgivings, fearing that I should encounter regrets when I had gone so far that the gate would be closed behind me. Fortunately, I hadn't practised dentistry long until I knew my fears were unfounded. I soon discovered that I was engaged in a profession that was full of real achievement and opportunity for new achievement. How seldom does the dentist labor for his patient that he hasn't the consciousness that he has rendered him a positive service! The zest this gives to our work is a very real part of our recompense. By contrast, what a depressing task it must be for the physician to tell all that can be told when consulted by the victim of cancer, Bright's disease, epilepsy, or any of a multitude of maladies for which the achievement of centuries has been very little!

Up till about the year 1800 extraction was about the only cure for toothache. Now, instead of allowing the carious process to take its course until the intolerable agony of it leads to the removal of the tooth, we can check the process, repair the lost tissue, and restore the organ to its normal use. A look back on the development of the art and practice of dentistry reveals a most interesting and gratifying achievement. The brains, ingenuity, and patient industry represented in amalgam, gold, porcelain, cast metal, silicate, and other fillings, and their value to mankind, are hard to realize even by the dentist himself. And then, when fillings fail, we have the various forms of crowns and bridge-work. Where their application is consistent with good engineering principles and sanitary requirements, what a boon they are to the wearer! Then there is the modern denture, whether of metal or vulcanite. What a blessing to the edentulous unfortunate! Many of us here have seen the full upper and lower dentures worn by George Washington, hewn out of solid ivory and of great price. Compare the misery that must have been endured in their use with the comfort that can now be given with common vulcanite den-

*Read before the New Jersey State Dental Society, 17th July, 1914.

tures, when these are made as well as they can be. The orthodontist, with his models and photographs setting forth the "before and after" of his work, almost figures in the role of a wizard—re-arranging the irregular teeth, improving their efficiency for mastication, minimizing their susceptibility to caries, and giving them their maximum esthetic value.

These by no means represent the whole gamut of dental achievement; and yet, when we look at it all critically, our pride must surely take a fall. Is not our labor for humanity very like an elaborate system of "swatting flies" instead of removing their breeding places!

If all mankind, civilized and savage, present, past, and prehistoric, were all similarly afflicted with dental caries, the situation would indeed seem hopeless. We might be excused in taking it all for granted, and going on much as we are doing. The savage, however, who is untainted by the influence of civilization, has teeth that are as near immunity as civilized man's are far from it. If all civilized mankind were generally susceptible we might still despair of doing anything more than improve our present methods. Or if immunity, on the one hand, were always associated with the highest degree of good health, and, on the other hand, susceptibility only found in those of low vitality and poor health, we might naturally assume that they were simply attributes or expressions of good or of bad health. But we all know that dental caries seems to obey no rule. We see one individual with generally good health, and yet with rampant caries; while another, with poor health, will be practically immune. Another person may seem to pass through periods of immunity and susceptibility. One individual may have a filthy, uncared-for mouth, and yet his teeth be immune; yet another, giving his teeth every care, is constantly in the dentist's hands. We often see members of the same family show the extremes of susceptibility and immunity where we should expect similar heredity and similar environment to give similar oral conditions.

It is this very seeming paradox that seizes the imagination and suggests that there must be some elusive factor or factors in the phenomena of dental caries which, when discovered and understood, will explain the anomalous character of all these facts.

Already scientific investigation of this problem has made positive progress. We are all more or less familiar with the work of Tomes, Magitot, Milles and Underwood, Miller,

Black and others. Tomes laid the foundation of the knowledge of dental histology and tooth development. Magitot's conclusions made caries the result of the action of chemical substances developed in the mouth or introduced with the food. Milles and Underwood determined that the tubules in dental caries contained micro-organisms. Miller differentiated the various micro-organisms found in carious dentine and separated out those which, in the presence of starch and sugar, produced lactic acid. Also he showed that lactic acid dissolved out the lime salts of tooth tissue, and he was able, artificially, to produce dental caries outside of the mouth that was identical with the natural process within the mouth. His findings were approved and accepted by the scientific world, and even to-day he is credited with the discovery of the cause of dental caries. The acceptance of his enunciation of the septic origin of dental caries, and the dependence of this process upon carbohydrate debris in the mouth, led the dental profession into a campaign as wide as civilization of oral antisepsis and prophylaxis, in the hope of coping with dental caries. While the results of this propaganda may have made it well worth while, it has been disappointing, for there still remains with us the large unsolved problem of susceptibility. Black's investigations proved that immunity and susceptibility had no explanation in the hardness or softness of teeth. For a considerable time after Miller's theory had been accepted the progress toward a further clearing of the mysteries of dental caries seemed to mark time. However, during the past ten or twelve years several valuable contributions have been made to the subject by various investigators. I shall refer to but two or three of them, as they will indicate what has been done recently, and the direction in which research is being made.

J. Sim Wallace has written several valuable works. Among them are "Prevention of Dental Caries," "Modern Dietetics and the Causation of Disease," "Physiology of Mastication," and others. The dominant note in all his books is the paramount importance of a diet requiring heavy mastication. He draws attention to the fact that, although our civilization has lasted many generations, the countless generations that preceded it make its period seem almost negligible. He speaks of this earlier period as the "pre-cibicultural era," that is, the ages that preceded the cultivation of food, when man lived on such food as was ready to hand, much as did the animals about him. This era, in his evolu-

tion, probably fixed the relation between his alimentary organs and the character of the food they had to take care of. The effort of civilization to improve the order of the past seems to have resulted in disorder. This disorder, Wallace claims, commences in the diet of infancy. It is unnecessary to go back to prehistoric evidences to study primitive man. We find ample opportunity to learn of him in the aboriginal races we find to-day that are still unaffected by civilized conditions. An interesting and significant observation in the study of these people is that most of them have neither cows nor goats to give them milk, and when an infant is weaned it has to use its teeth and masticate its food, while the civilized mother feeds her child cow's milk or milk-soaked food for years after weaning it, although it has an upper and nether millstone spoiling for something to do. Wallace sees grave consequences in this first departure from the order of things established in the precibicultural ages. The heavy mastication necessary for the aboriginal child develops the jaws and the size of the tongue; and, consequently, ample room awaits the permanent teeth as they come, and there can be little doubt that this does away with difficult or pathological dentition. Wallace is convinced that in the rough food, with the fibre and cellulose that accompany it, lies the explanation of the excellent teeth of the savage. As a test experiment, he succeeded in having fourteen children dieted from birth according to his convictions. At ages ranging from five to seven years their teeth were examined and not one tooth of any one of these children showed the slightest sign of caries. He states further that a similar number of children from the same class with their ordinary diet would have shown not less than 80 or 90 carious teeth at the same age. Wallace makes the modern refinement of food responsible not only for dental caries, but for the prevalence of dyspepsia, constipation, nasal obstruction and much of the physical degeneracy that follows.

The same subject, "The Prevention of Dental Caries and Oral Sepsis," is treated in a work by H. P. Pickerill. If there is anyone here who hasn't read this book, let me commend it to him, especially the chapter on "Saliva." While he also attaches much importance to food that requires heavy mastication, he finds the main cause of dental caries in the physical and chemical condition of the saliva, as influenced by the selection and balance of the articles of diet. His book is full of the results of all kinds of laboratory in-

vestigation, made with the object of ascertaining the relation between various kinds and combinations of food and an acid mouth favorable to caries, or, on the other hand, an alkaline mouth in which caries is inhibited. These results are all laid out in tabular form or indicated by curves. In his chapter on the "Incidence of Caries" the tables are most instructive. Among civilized peoples, where records could be made, the maximum proportion having carious teeth reaches as high as 98 per cent. and over, while in savage races it falls as low as 1 per cent. In this connection, Pickerill makes one very interesting and important observation. The Maoris, untouched by civilization, are among the very most immune of all races, and yet in examining 50 Maori school children, living under European conditions entirely, he found that 95 per cent. had carious teeth. This fact gives very poor support to the theory that heredity has much to do with immunity or susceptibility to caries.

His chapter on "Saliva" abounds in tables giving the results of many ingenious and interesting experiments; tables showing the effect of all kinds of food upon the amount and alkalinity of the saliva during and after eating; the effect on the saliva of various liquids taken with the food; the influence of acid elements in the food; tables showing salivary depressants; results of experiments on the saliva of lower animals; studies on the action and value of ptyalin. Pickerill's conclusions, after setting forth a mass of information, are: that normal saliva, in normal quantity, is a perfect protection for the teeth; that natural organic acids are the stimulants that excite the secretion of the greatest amount of those protective substances, and cause an alkaline flow of saliva for a long time after stimulation. His final statement is very positive. I shall quote it. He says: "that in the saliva is provided a natural and potentially perfect mouth wash acting continuously day and night; that it is, moreover, completely under control; that it may be altered or varied in amount or composition; that its beneficial effects may be increased or decreased absolutely at will." In another chapter the results of a series of experiments give the relative fermentibility of the various carbohydrate foodstuffs. Further tables set forth the effect of combining fruit or vegetable acids with carbohydrate food. I shall again quote his conclusions drawn from these experiments. He says: "Starches and sugars should on no account ever be eaten alone, but in all cases should either be combined with a substance having a distinctly acid taste or

be followed by such substances as have been shown to have an 'alkaline potential,' and the best of these, undoubtedly, are the natural organic acids found in fruits and vegetables." Other interesting and valuable chapters follow: "Dietaries of Immune Races," "Dietaries of Modern Civilization," "Ideal Dietaries," "Educational Measures," "The Need for Special Legislation," but time and the scope of this paper forbid even a reference to their contents.

This brief review of recent work done on the problem of susceptibility to caries would be quite incomplete without a reference to the contributions of Dr. E. C. Kirk. He has for years contended that, in addition to the fermentable carbohydrate debris left in the mouth from food, a dissolved carbohydrate, the product of metabolism, finds its way through the circulation into the mouth, and is an important factor in the causation of susceptibility. In an epoch-making paper, read to the Toronto Dental Society last November, Dr. Kirk reiterated his conviction that, in addition to the debris which he calls alimentary carbohydrate, there is also what he designates as metabolic carbohydrate, this dissolved carbohydrate derived from the circulation, and probably due to the over-ingestion of carbohydrate food. This element is a fertile culture-medium for the lactic acid-producing micro-organisms. Mouths that are rampant with caries abound with this metabolic carbohydrate, while mouths that are immune have little or none of it. In this paper Dr. Kirk advanced another theory which, if well sustained by further investigation, may solve many of the riddles that beset the problem of susceptibility. He drew attention to the well-established fact that an injury to the hypophysis cerebri results in a large increase in the carbohydrate content of the blood. Because of the close regional relationship of the hypophysis cerebri to the deep origin of the trigeminus, he believes it probable that pathological dentition results in a disturbance of this pituitary body and may be a factor in the high susceptibility of many individuals. It gives rise to the thought that if Wallace's diet for weaned babies and teething children were carried out there mightn't be pathological dentition, and that the enlarged pituitary body, with the accompanying abnormal carbohydrate content of the blood, and its influence on susceptibility, may be traceable to an unnatural and vicious method of feeding infants and children.

I shall not further review recent investigations on the subject of susceptibility and the cause of its prevalence

among civilized peoples. There are many other contributions of interest and value, but I have outlined enough for the purposes of my paper.

The bulk of the problem, of course, has yet to be worked out by the investigations of the man of science, but recent research has given us many new conclusions, some possibly correct, others probably correct, and still others as well established as the limitations of laboratory methods will allow. Surely an important part of the work lies at the door of the practising dentist. It is he who can try out and check up the conclusions of the laboratory man. If each one of us could experiment on even a few actual cases and report results to some central bureau, a mass of practical information would accumulate, from which many positive and valuable deductions might be made, and many a theory would either become a law or be set aside as untenable. It seems to me that the opportunity for the dentist to do a great service to humanity is very large. In his endeavor to lay his finger on the real cause of caries susceptibility, it seems more than probable that he is also discovering the real cause of many of the ailments and diseases that beset the lives of civilized humanity, and make for physical degeneracy.

If this metabolic carbohydrate that is found in the mouth, in the blood stream, in the very tubules of the dentine of carious teeth, is responsible for the rapid proliferation of many varieties of germs found in the mouth, what reason have we for thinking that its influence is confined to the mouth? Is it not probable that while this fertile pabulum is being poured into the mouth it is also being poured into the whole alimentary tract? May it not be responsible for the high bacterial content of the intestines, which Metchnikoff would combat with a buttermilk diet? May it not account for the high degree of infection so frequent in the appendix, and thereby explain the prevalence of appendicitis? And may it not also explain the susceptibility of one individual to typhoid invasion and the immunity of another who is similarly exposed?

Personally I have done but a fraction of what I might and ought to do along these lines. From the beginning of my experience as a dentist I have been much interested in the enigma of immunity and susceptibility. Although I have been possessed of neither the time nor the training which would enable me to do any scientific research on the problem, yet like any practising dentist, I have had much opportunity for making observations and drawing some conclu-

sions. I have for years enquired into the diet of patients exhibiting the extremes of immunity and susceptibility, and I long ago observed how generally susceptibility went with the excessive ingestion of sugar and sweetened foods. Miller's theory calls for the fermentation of the *debris* of carbohydrate food about the teeth. Now, the solubility of sugar, its constant dilution in the mouth with saliva, and the rapidity with which it must be swallowed convinced me that its baneful action on the teeth must be some reaction after deglutition, but I could get no further until Pickerill, Kirk and others bridged the gap for me. I learn that over-ingestion of carbohydrates resulted in a soluble carbohydrate returning to the mouth by way of the circulation. I learned that this substance was a most fertile culture medium for micro-organic life. On reading some of Pickerill's tables I found that my convictions regarding the culpability of sugar in the causation of caries were put to considerable strain, for he shows that cane sugar is far below chocolate, cake, pastry, and even toast, in the production of lactic acid. I strongly suspect, however, that the mischief done by sugar is as much indirect as direct, but none the less positive. Sugar is so attractive to the average human palate that it, or any food made rich with it, is eaten far beyond the normal promptings of hunger, and thereby the alimentary system is over-supplied with carbohydrate foods of various kinds. Sugar confronts us in so many ways. In candies and chocolate preparations. We dissolve it in our drinks, tea, coffee, cocoa, lemonade, etc. We spread it on our cereals, puddings, pastry and fruit. We cook it into our cakes, pies, puddings, etc., also in jams, jellies and marmalade. We find it in syrups and honey. It is indeed difficult at the ordinary table to avoid sugar and sweetened food, even when one wishes to, and, as I said before, it leads to the over-consumption of carbohydrate food. A homely example will point my argument. A hungry individual will eat heartily of meat and vegetables until he can be prevailed to take no more, and then he will eat a helping of some sweetened pudding, and perhaps a second helping. If, instead of the sweetened pudding, he had been offered plain boiled rice he would have eaten none of it, proving that the joke about the little boy's definition of a dessert was no joke at all. He said, you will remember, that a dessert was what you eat after you have had enough.

My enquiries as to the diet of immunes and highly susceptibles has made very strong my conviction that caries of

the teeth is largely a matter of diet. Frequently I have, for a time, thought I had found cases that contradicted, or were exceptions to, my usual experience, but further enquiry revealed that some point had been overlooked. An example or two will illustrate. I have a patient who is immaculate in the care of his teeth and rigid in his diet according to his lights. For years he exhibited less than usual susceptibility. Recently he presented himself and I found a surprising number of cavities. Upon enquiry there seemed no reason from his diet for the increased susceptibility, but further questions revealed the fact that for some time he had been trying to increase his weight, and, to that end, he was drinking each night a quart of milk, a large part of which he took in the form of hot cocoa. In view of the fact, set forth in one of Pickerill's tables, that chocolate is more than twenty times as fermentable as cane sugar, it was easy to suspect that his cocoa was responsible for his increased susceptibility.

Another case was a man of about 48 years. After unusual immunity for years, he suddenly exhibited several carious teeth. I probed for sugar in his diet. He confidently told me I should have "to guess again," as he wasn't fond of sugar and left the candies to the ladies. I made a detailed enquiry, running over a list of possible sources, naming jams, jellies, marmalade, honey, syrup, etc. At the mention of honey, his wife, who was standing by, exclaimed, "Why, George just lives on honey!" It transpired that some two years previously he had discovered something special in the honey line and was assured that it was most wholesome as a food.

In some cases I have had the patient for one week keep a detailed record of everything eaten or drunk, and some amazing menus have been revealed by this method which never would have come out with the ordinary enquiry. I have to thank Dr. Kirk for suggesting this way of getting at facts.

I shall refrain from a further recital of cases, as they are usually very tedious, but I might tell of several children with marked susceptibility, where I was able to gain the co-operation of both child and parent in the observation of a more correct diet. After the first year these cases have become practically immune, and, with it all, a noticeable improvement in general health.

I have found some difficulty in the matter of instructing patients about a diet. One may tell them to choose the

rougher, more fibrous foods that will demand mastication; to cut down their consumption of sugar and sweetened foods; to eat succulent vegetables and fruits, etc. But these are generalities, and many patients don't seem to be able to follow them intelligently. It has taught me the need of having a more specific or detailed diet to recommend. To this end would it not be possible and practical to have a few committees in various centres, composed of, say, a dentist posted on the essentials of diet for the well-being of the teeth and mouth; a physician, with special fitness as an alimentary specialist, and the head of a domestic science school, and have these committees work out a week's menu, physiologically correct, and at the same time presenting an agreeable and appetizing variety. Along with this physiological bill of fare might be appended, or paralleled, a list of those foods or combinations that should be avoided. I am well aware that a menu suitable for one would not be best for all. Age, occupation, climate, and other things would call for modifications of a general diet. But the vital principles that are essential for one would probably be the same for all, except perhaps in some pathological cases.

We are all familiar with the work done by the dentist in the public schools of Cleveland and other centres to arouse public interest in the national importance of having the rising generation grow up without the handicap that goes with decaying teeth and foul mouths. It has been abundantly proved that much of the physical degeneracy about us and, with it, mental and moral degeneracy, are traceable to dental caries and septic mouths. If the dentist did no more for the public weal than the carrying out of this work, the results should entitle him to a place among the noble professions; but I am convinced that a far greater opportunity for service is knocking at his door. I am satisfied that our scientific investigators are establishing a positive relationship between a faulty selection and balance of diet and dental caries. I am hopeful that, with the organized co-operation of the practising dentist, it will soon be possible to put practical immunity to caries within the reach of all; and in wiping out the causes of dental caries there is little doubt that with it will disappear many of the maladies that afflict civilized humanity and make for degeneracy.

Sir William Osler said recently that the next great thing in the matter of public health is coming from the dentist. Is the professional spirit of the dentist and his interest in the welfare of mankind large enough to find him enlisted in the work that will fulfil the prophesy of the great physician?

“Pathological and Bacteriological Considerations of Interest to the Dentist”

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THE object of this paper is to endeavor to bring the pathological laboratory before the profession; to show what is being done at the College along the line of pathological histology and bacteriology, and briefly to outline the advances that have been made in the subject. Pathology is the study of disease process, including the causative factors of disease. Pathological changes in the body may be noted as signs and symptoms, and these changes from the normal are brought out by clinical observation and examination. The laboratory is one step further, where by the use of sectioning machines, the microscope and the incubator, we show the relation between clinical findings and pathological histology and bacteriology. The laboratory, then, is simply an aid to diagnosis and treatment, and cannot replace careful observation and examination, the results of which have carried our profession to the high place it occupies in the esteem of the people. Recognizing the need of such a laboratory, one which would bring the infirmary into closer touch with the teachings in pathology, make the student broader in his diagnosis and treatment of cases under his care, and also one in which research work along pathological lines might be conducted, the Royal College of Dental Surgeons has equipped one, thoroughly modern in its appliances and methods.

Bacteriology concerns itself with the study of micro-organisms and has attained the dignity of a special science, its importance in relationship to pathology having been early recognized. Since the time that Anton van Leeuwenhoek, the Dutch lens maker of Delft, viewed with wonder through a microscope of his own making, “tiny animalcules, which moved about in a most amusing fashion,” till the present day with its mass of knowledge, technique and equipment, and a special literature of its own, the way of bacteriology has been a long and arduous one, beset on all sides by barriers of misunderstandings and fantastic theories, and obscured by a darkness of mystery which was

afterwards lightened by the brilliant researches of Pasteur and Robert Koch. Then technical methods were introduced, which placed the study of bacteria upon the basis of an exact science. The appliances in a pathological laboratory used in its study are many, and in the following paragraphs a short description of some of the most important shall be given.

To cultivate bacteria successfully it is necessary to have a material which resembles as closely as possible the material upon which they grow naturally. In certain cases growth can be obtained only when the medium has been changed to suit the peculiar requirements of the micro-organisms, but for the ordinary pathogenic bacteria, nutrient agar is generally used. This is composed of meat extract or the soluble constituents of meat, to which has been added distilled water, common salt, peptone and agar, which is a carbohydrate product derived from the stems of certain seaweeds growing in the Chinese seas, commonly known as "Ceylon moss." Glassware, the common forms being test tubes, Florence flasks and Petri dishes, is used to contain the media. When the transference of bacteria from pathological material to the medium has taken place, this being generally done by means of a piece of platinum wire attached to a glass rod, the infected medium is placed in a temperature suitable to their development. Most pathogenic bacteria require a temperature of 37.5 degrees C., which can be uniformly maintained in an apparatus known as an "incubator" or "thermostat." The laboratory of the College is equipped with two incubators, one which consists of a double-walled copper chamber fitted with a set of double doors, the outer being made of asbestos-covered metal, the inner of glass. Water fills the space between the two walls and, being a poor conductor of heat, does not permit rapid changes of temperature within the chamber which contains the growing bacteria. A gas flame placed beneath supplies the heat. The other thermostat is a larger and more elaborate one and is heated by electric lamps placed within the chamber. It is regulated to a temperature of 37.5 degrees C., and by means of a thermo-regulator that temperature is maintained constantly. The outside covering is made of oak, and the lining of asbestos.

The necessity of freeing from extraneous organisms of all kinds the food media, which is to be used for the growing of bacteria; the glassware, in which the food media is contained, and the instruments which come in contact with in-

fectured materials and cultures, introduces the subject of sterilization or disinfection. It might be well at this point to distinguish between the terms "disinfectant" and "antiseptic," which are so often carelessly used. A disinfectant is an agent that completely destroys bacterial life, while an antiseptic does not kill the micro-organisms, but inhibits their growth and multiplication.

Many agents have an injurious effect upon bacteria. Drying, light, electricity and heat are the main physical ones, heat being the most efficient and applicable. In the laboratory it may be used in the form of dry heat, or as moist heat, according to the nature of the materials to be sterilized. The two methods do not show the same degree of effect when the same temperatures are maintained. The researches of Koch, Gaffky and Loeffler show that by placing in boiling water in from one to twelve minutes, the spores of anthrax were destroyed, while the same effect was accomplished in dry hot air only when the exposure lasted three hours. Zinsser explains the phenomena as being caused by the changes in the coagulability of proteids brought about in them by the abstraction of water. Proteids containing an abundance of moisture are coagulated at a lower temperature than those containing no moisture. The apparatus used in a bacteriological laboratory for carrying on hot air sterilization is known as a "hot air chamber." The chamber consists of an outer and inner case of sheet iron. The outer one has a large hole at the bottom, beneath which is placed a Bunsen burner, the flame from which plays upon the inner case, and the heat rises between the two cases and escapes through the holes at the top of the outer one. A thermometer is fitted at the top, passing down into the inner chamber. Materials placed in a chamber of this kind for one hour at a temperature of 170 degrees C. will be freed from all organisms. This form of sterilization is used for all kinds of glassware, Petri dishes, Florence flasks and culture tubes.

Moist heat may be applied as boiling water, and instruments, syringes and steel objects can be sterilized by being placed in it for five minutes, this being sufficient to kill the vegetative forms of all bacteria. One of the best methods of moist heat sterilization is the use of live steam, the apparatus for its application in the laboratory being known as an "Arnold" sterilizer. It consists of a main or sterilizing chamber placed over a reservoir which is constructed with a false bottom, forming a shallow receptacle. Water is

placed in the reservoir, which feeds constantly the smaller one beneath, and when heat is applied, steam is produced quickly, which rises through the main chamber, and is condensed and collected by an outer jacket. The process of "fractional sterilization" is applied in the sterilization of media, and an "Arnold" sterilizer is used. Instead of exposing the media to one continuous steaming for an hour or more, the method adopted is to steam for fifteen or twenty minutes on three consecutive days, keeping the media in the intervals at a temperature of from 20 degrees to 37.5 degrees C.

Steam under pressure is the most rapid and powerful method of sterilization used. By this method sugar free broth and agar, discarded cultures, test tubes and apparatus are heated and the bacteria destroyed. The apparatus used is known as an "autoclave." The one used in the College laboratory consists of a copper cylinder supplied with a lid, which is fastened down by nuts and screws, and fitted with a pressure gauge, safety valve and thermometer. The lower part of the cylinder is filled with water, and rising above this is a diaphragm which supports the objects to be sterilized. The heat is supplied by a large Bunsen burner placed underneath. A steam pressure of fifteen pounds for twenty minutes is sufficient to kill bacterial life of all kinds.

Before proceeding with a description of some of the appliances and methods used in pathological histology, a brief explanation of some of the more common terms associated with bacteriology might be of interest.

The means of defence by which pathogenic bacteria are disposed of, after their invasion into the tissues and fluids of the body, or at least prevention of the elaboration of their poisons, is known as resistance. When this is especially marked it is spoken of as immunity. When the power of resisting infection is natural to a species, race, or to an individual, it is then called "natural immunity," but when a state of natural susceptibility is transformed into a state of resistance, it is then called "acquired immunity." It may be either "active" or "passive." Active immunity depends upon elaboration within the tissues of the organism concerned, various substances inimical to bacteria and their products. These substances are called "anti" bodies. Passive immunity differs from active, in that the organism does not generate protective substances in its own defence, but is protected from the poisons by the transference of substances from the body of another animal, actively immunized to

those poisons, the process being a passive one as far as the organism receiving the treatment is concerned. Those specific bodies which neutralize the poisons produced within the tissues by a pathogenic organism, are known as "anti-toxins." The anti-toxins which have reached the broadest application and the most beneficial results are those used in the treatment of diphtheria and tetanus, diseases caused by bacteria producing powerful toxins.

Active immunity may be brought about in several ways; for example, the injection into the animal body of living fully virulent bacteria, or bacteria of diminished virulence, or, again, dead bacteria. The vaccination against smallpox is the best known example of the use of attenuated cultures. The incorporation of dead bacteria can be very well exemplified in the use of vaccines in the treatment of pyorrhea alveolaris. In these cases, where possible, "autogenous" vaccines, or those made with the bacteria isolated from the patient himself, should be used. While discussing this subject it might be of interest to review as briefly as possible the preparation of the vaccine.

The first step is the collection of the specimen to the exclusion of all extraneous bacteria. When the mouth has been cleansed, special care being taken with the gum margin and the tooth, by means of a capillary pipette or a very fine probe, specimens may be taken from the desired localities. Dr. Hitchens has invented a tiny spear-shaped platinum spoon, which is heated to redness and plunged through the sterilized area. Then it is withdrawn and the contents planted on a culture medium. Some of the contents of the spoon are placed on a glass slide and, when stained with Gram's stain, are examined. When sufficient growth has taken place on the medium, two or three cubic centimetres of sterile salt solution are introduced into the culture tube. The growth is washed off the surface of the agar, and this emulsion is placed in a sterile test tube, the open end of which is drawn out into a capillary opening. The next step is the standardization of the emulsion, that is, the estimation of the number of bacteria per cubic centimetre. Wright's method is the most popular. Using a capillary pipette upon which a blue mark has been made about one-half inch from the end, after a finger has been pricked, blood is taken into the pipette exactly to the blue mark. Then as much more of the emulsion is drawn into it and the two columns forced out upon a clean slide. A smear is made on a fresh slide, and when it has been stained with a blood stain, Wright's

being one of the best, the red corpuseles and bacteria in a number of fields are counted, and the ratio between them is estimated. As the number of red blood cells on a cubic millimetre of the blood is known by a previous blood count, it is not difficult to estimate the number of bacteria in a cubic millimetre of the emulsion. It is then sterilized by suspension in a water bath at 60 degree C. for one hour, and diluted with sterile physiological saline solution, so that every cubic centimetre will contain a certain number of bacteria. The sterility of the vaccine is tested before being employed, by culture controls, and if no growth is found it may be considered safe for therapeutic use.

We have all heard of or read about the "Wasserman reaction," which is so extensively used for the diagnosis of syphilis. The reaction depends upon the fact that complement fixation takes place when an antigen, a substance which stimulates the formation of antibodies, and its specific antibody are mixed in the presence of complement, that is, that the complement, which is the antibody present in normal serum, is fixed so that it is no longer free in the mixture, when an antigen is mixed with its antibody in its presence. The serum to be tested is obtained, after surgical precautions as to sterilization, from the median basilic vein of the patient.

Another well-known reaction is the "Von Pirquet," for tuberculosis. Quoting Hiss, the noted bacteriologist: "Von Pirquet has suggested the cutaneous use of tuberculin for diagnostic purposes. A 25 per cent. solution of 'Old Tuberculin' is made in the following way:

Tuberculin	1
Salt solution	2
5 per cent. carbolic acid in glycerin.....	1

"After sterilization of the patient's forearm, two drops of this solution are placed upon the skin, about 6 cm. apart. Within each of these drops scarification is done, and the skin between them is scarified as a control. Within twenty-four to forty-eight hours, in tuberculous patients, erythema, small papules and herpetiform vesicles will appear. The action is irregular, and more reliable in children than adults. According to recent investigations, about 70 per cent. of adults show a positive reaction, and in such cases it is probable that an old healed tuberculosis may give rise to a posi-

tive test where absolutely no active process exists. Recently Von Pirquet has modified his procedure by using instead of the 25 per cent. solution given above, the pure, undiluted "Old Tuberculin."

In the study of pathological histology nothing is of greater importance for its success than skilful technique. The greatest function of that technique is to fix tissues, so that under a microscopic examination, the finished preparation will present a trustworthy picture of every tissue element or pathological product. Some objects, such as detached epithelia, scrapings from organs, and blood, can be examined without extra preparation, but for the ordinary tissues and organs of the body, thin transparent sections are necessary to permit a satisfactory microscopic examination of their elements, and the relationship of their structural units.

In order that the finished product will present a true picture of the tissue structure, the tissue itself must first be preserved. In order that the picture will show the details which existed during life, the tissue must be killed quickly, the process being known as "fixation." The fixing fluids most commonly used in the College laboratory are Zenker's fluid, and formalin of 10 per cent. strength. Then follows the "hardening" process, which is done by passing the specimens through graded alcohols, 70, 80, 95 per cent., and finally absolute. The "embedding" process follows, which is the impregnation or saturation of the object with some embedding mass, so that the most delicate parts of the tissue will be retained in position by the support of the embedding material, when it is cut into thin sections. The materials used for embedding may be divided into two classes; first, such as are fluid, when warm, in this state penetrating the tissues and becoming solid when allowed to cool; second, such as are fluid when in solution, becoming solid upon evaporation of the solvent. Paraffin is the best example of the former and celloidin the latter.

Instruments devised for the purpose of cutting sections are known as "microtomes." For paraffin section work, the one used in the pathological laboratory is known as the "Minot Automatic Rotary Microtome." In this instrument the knife is carried by two upright standards, which can be adjusted according to the distance desired from the object. The paraffin block containing the embedded tissue

is fixed to an object carrier, adjustable to any plane, and which is raised or lowered by a crank working in a slide, and joined to an axle to which a wheel is attached. The micrometer screw is carried by the vertical carriage which supports the object holder. When the sections are made they are put through a special process, stained and mounted, and are then ready for examination under the microscope. For the cutting of celloidin sections, a "celloidin microtome" is used. The celloidin block is kept stationary, while the knife is attached to a block which moves on a slide, every sweep of the blade cutting off a section the thickness desired. The sections are stained and mounted, the process differing slightly from that used in paraffin work.

In conclusion, the writer desires to say that this laboratory is at the service of the dental profession in Canada. While at present the majority of cases come from dentists in Toronto, it is to be hoped that the practitioners throughout Ontario, and out in the West or down East, will make use of it. The average dentist comes in contact with many cases in his practice that require the help of a pathologist; for example, in the diagnosis of benign or malignant tumors of the gums or jaws; or, again, in the diagnosis of syphilis, in the differentiation between it and carcinoma. It is the right and privilege of every dentist to render to his patients the highest type of service in this regard. The dental pulp, the most important part of a human tooth in many ways, is particularly susceptible to diseases, most of them of an inflammatory character, but very often retrogressive in nature. The relationship between cause and effect, symptoms and pathologic changes in the pulp is not fully understood. If dentists would send to this laboratory pulps placed in 10 per cent. formalin, and short histories of the symptoms noted, a description of their microscopic examination would be sent back, and mutual benefit derived thereby. All tissues must be first placed in 10 per cent. formalin and addressed to the Pathological Laboratory, Royal College of Dental Surgeons, Toronto.

A dentist in Omaha was recently sued for damages on the ground that in the extraction of a tooth an excessive amount of cocaine had been used in the operation. The defence of the dentist was that the conditions had arisen not because of the use of cocaine but because of an alveolar abscess which was present before treatment was commenced.

*Christianity and the War**

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THE war that has broken over Europe will be the wonder and horror of future generations. There has been no more tremendous time in human history. Great nations have their armies in the field. Great fleets are prowling the seas. Hundreds of thousands of the people are being shot to pieces. Capital to an immense amount is being destroyed. There will be infinite misery and privation and widows and orphans that cannot be numbered.

An awful responsibility rests upon those who have brought this calamity on the world. While an increasing number of thoughtful and sensible people have been crying out with bitterness against militarism, there has been an enormous expansion of armaments and armies within the last thirty years. The world has been the victim of one of the wildest insanities that ever burned in the blood of the brain. It has been constantly asserted that, after all, war is a desirable episode in the life of a nation. The Crown Prince of Germany declared but six months ago that all the talk of universal peace was "but the babbling of infantile minds." "It is un-German," said he, "for war is a moral tonic that stirs up the nation's sluggish blood. Without it a nation must inevitably become effeminate, cowardly, and weak." How familiar that sounds! Could any argument be more atrocious? A school for the development of virtues—forsooth! Men who want to develop manliness and courage have abundant opportunities without going to war. Let them be true men in any sphere of life and they will be subjected to as severe a test as any that the battle-field affords. We have all known men who could stand on the battle-field amid a murderous rain of bullets as calm as on a parade day, and yet failed miserably in the conflict with the rulers of the darkness of this world and the spiritual wickedness in high places. No braver man than Jesus ever lived. The military doctrines of the Kaiser were rampant in His day. Men believed that "To overcome in battle and subdue nations, and bring home spoils, with infinite manslaughter, shall be held the highest pitch of human glory."

*Address delivered before the Toronto Dental Society, Monday, January 18th, 1915.

And yet Christ never struck a blow. He refused to wade through streams of human blood to empire. It is generally the men who do not expect to fight themselves, or to have their home or fortune ruined, who say with such smoothness "War is a good thing." John Ruskin used to say to the aristocracy of England, "If war broke the china on your sideboard you would put an end to it at once."

But do not blessings follows war? Charles Jefferson has given the inevitable answer, "Yes. They follow everything. They follow famine, pestilence, calamity, crime." No demon can put his foot down so hard upon this earth that a flower will not spring up as soon as his foot is removed. This is due to the overwhelming goodness of God. He compels the wrath of men to praise Him, but the wrath is not therefore justified. No matter what man may do good will follow. Let him burn down the leafy forests and the land will be enriched by the ashes and ready to bring forth luxurious harvests. The famine in India was followed by blessings. It softened the world's heart and strengthened the bonds between the East and the West. Shall we ask for another famine? War brings with it great blessings! Yes, and it brings with it direful and immeasurable curses. Surely the curses outnumber the blessings, and the blessings might be secured at a less frightful cost.

For too long the nations have believed the false philosophy that, in order to preserve the peace, we must prepare for war. This has been the Kaiser's doctrine, expressed again and again. It is one of those half-truths more dangerous than a full-blooded lie. What he should have said was, in order to preserve the peace we must prepare for peace. Multiplying the instruments of war only stirs up bad feeling and makes it easier to come to blows. The advocates of this false philosophy see the outcome. Verily they have their reward! The war has come. Preparation has exploded. Outrageous plunder has passed into outrageous bloodshed. All Europe is in revolt against this doctrine. There is no going back now to peace; our men must die in heaps; we cannot delude ourselves with dreams of easy victories; we must all suffer endless miseries and anxieties; scarcely a human affair is there that will not be marred and darkened by this war. Out of it all must come one universal resolve: that this false philosophy must be plucked out by the roots. Whatever follies still lie ahead for mankind, this folly at least must end.

And yet, while no one hates war more than I, and no one

believes more intensely that it could be avoided if the nations had the spirit of Christ, permit me to remind you that some things are worse than war. The supremacy of evil is worse; the reign of avarice is worse; the dominion of lust is worse. Peace is desirable, provided it be honorable peace; but never when it means the surrender of principle, the sacrifice of honor, the compromise of truth. The wisdom from above is first pure and then peaceable. There must be no peace that allows greed and selfish lust for power to have their way. This is why the mother country could not remain neutral in this war. She had engagements with France and with other nations had guaranteed the independence of Belgium. She was asked to set those engagements aside in order that the German armies could cross Belgium, overrun France and have Great Britain isolated in Europe. There was a deliberate violation of treaties by Germany and a cynical suggestion that treaties should be as lightly regarded by the British people. If Germany had only contempt for treaties in making war, would she be more likely to respect professions and pledges when she had become the supreme power among European nations. Sir Edward Grey, the world's greatest diplomat, sought for peace until the twelfth hour had struck, yea long after; but not peace at any cost. If Great Britain had bought peace by repudiating her engagements she would have earned the world's contempt. All that we mean when we talk of British honor would have become a by-word and a hissing. The man who does not keep his word is a poor figure among his fellows. The government which does not keep its word dishonors those for whom it speaks and acts.

"For a scrap of paper" said the Imperial Chancellor of Germany in his final protest to the British Ambassador, "why should you make war on us for a scrap of paper?"

"Because," Britain's spokesman replied, "because that scrap of paper bears the signature, not of Germany alone, but of Britain as well." The scrap of paper was only the treaty signed by Prussia and Britain in 1870, guaranteeing the neutrality and integrity of Belgium in the midst of the crowding European powers. For that scrap of paper rivers of British blood will flow. Premier Asquith, whose level head and stout heart is the Empire's greatest asset in this perilous time, flung back Germany's bargaining terms and called them "infamous proposals." He declared that he would sooner see the British nation wiped off the map of history than to see her break her word at this time. In that

language he revealed Britain's standard of national honor. Breathes there a Canadian with soul so dead who does not thrill to his finger tips to belong to the British Empire at such a time as this?

But what is the relation of Christianity to this conflict? There are those who say that war is always wrong. At the head of this school stands Leo Tolstoi. They maintain that the army is a libel upon our boasted civilization; that the navy is a stain upon our seas; that no true Christian can advocate war or engage in military service. With this I cannot agree. Genuine Christianity is positive, vital, aggressive. It can never be neutral in the presence of wrong. The British Empire was never more Christian in her history than when she said to Germany: "You take your hands off little Belgium or you will find a lion at your throat and a bear on your back."

It is written of the late Henry Ward Beecher, in his authorized biography, that when the terrible struggle began on the American continent—one of the most terrible in history between men of the same household, the same blood, speech and flag—he, the spokesman of the liberties of the slave, gave himself to moulding bullets, and when his sister came into the room to ask why he was doing that, and for what purpose he was fashioning those messengers of death, his grim answer was, "To kill men!" The rifles that he paid for and sent to the front were labelled "Beecher's Bibles," and in the whole of the United States during that awful year the man who would have held back at the call of the colors when he was needed in defence of the liberties of the oppressed would have been rightly named a coward. Thus I believe that the rifles our Canadian lads will take to the front during this war may well be labelled "Canadian Bibles," to be used in fighting the battle of the downtrodden and the oppressed.

If I were an American citizen to-night I would have to ponder deeply these words taken from the editorial page of a well-known American magazine: "When we had an opportunity to protest with regard to the violation of the Hague convention concerning neutral territory, we held our peace; but now when questions of American commerce arise, we protest. Belgium suffered, and we said nothing; our trade suffers and we speak. On questions of honor and obligation we keep silence; we raise our voice only when dollars are involved. And this matter is more disturbing because the only protest we launch is against those who are fighting our

battle for liberty and democracy." If I were an American citizen to-night I would prefer the private attitude of Woodrow Wilson to his public attitude. In speaking at Denver in 1911 he used this significant language: "No man can sit down and withhold his hands from the warfare against wrong and get peace out of his acquiescence. The most solid and satisfying peace is that which comes from this constant spiritual warfare, and there are times in the history of nations when they must take up the cruel instruments of bloodshed in order to vindicate spiritual conceptions. For liberty is a spiritual conception, and when men take up arms to set other men free there is something sacred and holy in the warfare. And this great Book (the Bible) does not teach any doctrine of peace so long as there is sin to be overcome in one's own heart and in the great moving force of human society." If I were an American citizen to-night the words of James Russell Lowell would sound strongly ominous in my ears:

"Once to every man and nation comes the moment to decide,
In the strife of Truth with Falsehood, for the good or evil
side;
Some great cause, God's new Messiah, offering each the
bloom or blight,
Parts the goats upon the left hand and the sheep upon the
right,
And the choice goes by forever 'twixt that darkness and
that light."

With the facts in our minds I pass on to notice some of the duties that await us as Christians. Our religion is on trial. The scoffer has already declared that this war shows the failure of Christianity. Nothing could be further from the truth. But this war marks a testing period in the history of the Christian faith. If we are to meet the emergency we must: (1) *Keep our faith high*. Faith conquers the world. It discovers allies. Part of the host have crossed the flood, but they have not gone out of the fight. The "great cloud of witnesses" are still part of the army in this campaign for the destruction of oppression and barbarism. Faith discovers this army of the skies. Faith acquires power. It connects with the Almighty as the electric wire with the power-house. He whose faith in God remains unshaken will enable his nation to overcome. Faith releases power. It makes it possible for God's personality to enter

the campaign. It is the track along which the mighty energy of the eternal runs to the overthrow of injustice. (2) Our second duty is to give a practical demonstration of Christianity. Steadiness and self-control are not desirable only, but sacredly imperative; the sternest individual self-discipline and self-surrender—that is what we can each contribute to the common good. Emotions, however natural in ordinary days, must be held in check now with a stern grip as we brace ourselves to the exercise of a quiet, straightforward, purposeful Christian manhood and womanhood. There must be no selfish rivalries in great or little things—no taking advantage of one another in the affairs of common life, at a time when ordinary rules are out of gear. “Bear ye one another’s burdens and so fulfil the law of Christ. (3) The third great duty of every Canadian patriot is to pray. The importance of this has already been recognized by the King and Imperial Parliament. We have been urged by them to pray for a “better understanding among the nations of the world and for the success of the allies.”

The thoughtful man asks, Will it make any difference to the issue if we give ourselves to concerted intercession? Believe me, if we fail in doing this in season and out of season, with fervour and devotion, with humility and conservation, we are omitting the prime factor in all that makes for good. There is a sense in which all the worthy deeds done in the world are done by prayer, for prayer sets in motion the forces that produce them. Thought precedes action; it is the spiritual cause of the material effect; and thought based on confidence in the British principles of righteousness and justice, thought which sees the finger of the Eternal weaving the national fabric, is mightier far than any other kind of thought. It is prayer, prayer winged by faith, and there is no limit to what it may accomplish. Let such prayer be directly, perseveringly, and confidently addressed to the God of battles and it will change the face of history, as it has often done before.

Let us betake ourselves to prayer—we who watch from afar the varied fortunes of “our far-flung battle line” on land and sea. It is no light thing to summon the infinite resources of the spiritual universe to our aid. Who would dare to say how much such a proceeding could accomplish? A nation in arms and a nation at prayer! Can we afford to have the one without the other? We are told to pray for a better understanding among the nations of the world. That can only come through the defeat of Prussian autocracy and

Prussian militarism. The Kaiser is a king after Charles the First's own heart, "a king indeed." He is still able to associate Providence with his rule. "I regard my whole position," he says, "as given me direct from heaven, and that I have been called by the Highest to do His work." Sometimes, indeed, even the Almighty is subordinate. "There is only one master in this country," he tells the representatives of Brandenburg, "that am I. Who opposes me I shall crush to pieces." Democracy, which has devoured all the rest, thunders at the base of his throne. It has been leaping higher and higher. The day is coming when a wave shall submerge all, and "divine right" will have passed forever from kings to peoples. Then the Kaiser will rule by consent or not at all. He has been compared with Napoleon. The comparison is unjust, to say the least. But they both appear to have the same lust to master Europe. Let any man think over the career of Napoleon. See him conquer the Alps and mingle the eagles of France with the eagles of Italy. Follow him to Marengo and to Austerlitz; follow him to Russia, where the infantry of the snow and the blast smote his legions; follow him in his escape from Elba, when he retook an empire by the force of his genius; follow him to Waterloo, "where fate and chance combined to wreck the fortunes of their former king"; follow him to St. Helena, where he stood by the hour gazing upon the sad and solemn sea. Then think of all the widows he made, of all the orphans, of all the tears that had been shed for his glory. As one thinks over that career he feels like saying with Robert Ingersoll, "I would rather have been a French peasant and worn wooden shoes and lived in a little hut—I would rather have lived and died unnoticed and unknown except by those who loved me, and gone down to the voiceless silence of the dreamless dust—I would rather have been that French peasant than to have been that imperial impersonation of force and murder who covered Europe with blood and tears." Germany will not cease to be a disturbing element in world politics until the Kaiser has stepped down from his mediaeval throne and derives his power from a free and self-governing people.

We are requested to pray for victory. It is as clear as the light of heaven can make it that our cause is just. We are fighting against a wrong spirit, a spirit of aggression, an ideal of domination, of reliance upon brute force, which, if triumphant, would plunge the world in woe. It is Christ or Bernhardt—which is right? Which is going to survive?

The German war spirit is deeply stained by the revolt of young Germany against Christian ideals, by an avowed reversion to the warrior ideals of the old Goths, which Christianity displaced in the fifteenth century. The warriors' courage is steeled by the banishment of pity. Christian altruism is decried as weakening. Thor and Odin are quite seriously summoned back again by the militant youth of the country. No one needs to be told whither that sentiment leads, and it has infected practically the whole German nation more or less. Their leaders do not hesitate to say so. Is Bernhardi's teaching that of the Sermon on the Mount? Nay, rather is it not that of the very pit of hell? What becomes of the ideals of universal brotherhood, of democratic freedom and equality, of Christian love, while this spirit is about? Does anyone doubt what would happen to mankind if it gained the day? Therefore I pray God prosper the arms of Britain and those who fight by the side of Britain, for to them is committed not only the defence of our ancient institutions and our traditions of truth and honor, but the deliverance of the whole world from the greatest spiritual evil that has menaced it in modern times.

The Dental Needs of the Soldier

THE correspondent of the Associated Press, in writing of the conditions of British soldiers at the front, says: "Diseased teeth are playing havoc with the English troops exposed to cold and dampness in the trenches. Many dentists have been sent to the front to treat defective teeth which have caused neuralgia and disabled men otherwise sound.

"Recruiting officers were at first very particular about the teeth of applicants for admission to the army, but it soon became necessary to let down the bars. As the middle and lower class of people of England take indifferent care of their mouths and seldom have their teeth treated, dental troubles have been numerous.

"The developments of the last three months have shown that no soldier is any better than his teeth. Inability to masticate the coarse army fare properly has incapacitated large numbers of soldiers, who were not actually forced to leave the front because of aching teeth and swollen jaws, aggravated by standing for days in wet trenches.

“It is not unusual to see new recruits who have part of their front teeth missing and others badly decayed. But such men are turned over to the dental corps as rapidly as possible and given careful treatment. If recruiting officers in England were to demand the sound teeth required for admission to the American army they would get few recruits.”

The University of Toronto and the Present War

THOUGH the military organizations of the Canadian Colleges were in a much more rudimentary condition than those of the British Universities, a large contribution has already been made to the army for the present war from their graduates and undergraduates.

The following is an account of what has been done by the University of Toronto:

FIRST CONTINGENT.

Officers—Lt.-Col. C. H. Mitchell, B.A.Sc., member of the Board of Governors; Lt.-Col. R. D. Rudolf, Professor of Therapeutics; Lt.-Col. W. A. Scott, Associate in Surgery; Major P. Goldsmith, Demonstrator in Oto-Laryngology; Captain, G. R. Philp, Demonstrator in Anatomy; Captain P. K. Menzies, Assistant in Clinical Surgery; Captain G. A. Cline, Instructor in University Schools; Captain C. E. Cole, Demonstrator in Therapeutics; Dr. B. E. Clutterbuck, Assistant in Gynaecology; Dr. A. J. Mackenzie, Demonstrator in Medicine, and Mr. E. Owen, Lecturer in German.

According to our most recent information there are, besides the members of the staff, 134 graduates and 86 undergraduates, and of these 137 are officers and 83 privates. The chief electrician and several of the laboratory assistants are also on service, and their places are being kept for them. Professor de Champ, and Messrs. Balbaud and Bibet of the Department of French in University College have been serving with the French army since the beginning of the war.

SECOND CONTINGENT.

Officers—Lt.-Col. Fotheringham, Associate-Professor of Clinical Medicine, is Chief Medical Officer. Other members of the staff who have been giving their time in preparing

for its mobilization are: Captain J. A. Amyot, Professor of Hygiene; Lt.-Col. J. A. Roberts, Demonstrator in Clinical Surgery; Lt. G. B. Strathy, Demonstrator in Clinical Medicine; Lieut. Bruce Robertson, Assistant in Pathology.

At present our information is quite incomplete, but we have the names of 53 graduates and 63 undergraduates who have been accepted.

ACTION OF THE SENATE AND FACULTIES.

At the opening of the session the Caput, Senate and the Faculty Councils passed regulations to provide that standing should be granted to those who by reason of enlisting had been unable to take their September supplementals; also, that those who had enlisted or who would do so, should be shown the utmost consideration at the end of the session that the University's duty to the public in maintaining professional standards will allow.

It was further decided to discontinue all teaching and laboratory work after four o'clock in the afternoon in order to enable students to take the courses of drill and instruction required by the regulations of the Officers' Training Corps.

THE OFFICERS' TRAINING CORPS.

In view of the probable establishment of an Officers' Training Corps in the University, a score of junior members of the staff began about September 15th to take drill and instruction to qualify themselves to become officers in the new corps. About October 20th authorization was received from the Militia Department. Dr. W. R. Lang, Professor of Chemistry, who with the concurrence of the Board of Governors had volunteered for active service but was appointed Instructor for this Military Division, was made Colonel of the new corps. Messrs. C. S. McVicar, A. D. Le Pan, G. N. Bramfitt, C. H. C. Wright, R. H. Hopkins, G. H. Needler, F. C. A. Jeanneret, L. Gilchrist, M. W. Wallace, G. O. Smith, C. N. Cochrane, C. V. Massey, G. M. Smith, E. J. Kylie, G. S. Brett, E. S. Ryerson, A. F. Coventry, G. Gallie, W. F. McPhedran, R. G. Armour, D. Graham, C. R. Young, D. G. Hagarty, A. M. Thomas, A. W. McConnell, W. M. Treadgold, B. M. Morris, H. H. Madill, J. R. Cockburn, J. R. Mitchener, V. E. Henderson, H. R. Hopkins, A. R. Leggo, W. S. Wallace, H. G. Manning, all except three being members of the staff, have been appointed officers. The students enrolled enthusiastically, and though the strength authorized as yet is only 1,000, over 1,800 have been taking drill.

On Friday, January 22nd, 1,500 students with their officers were reviewed by His Royal Highness the Duke of Connaught. He addressed them in part as follows: "I wish to express to you my very great satisfaction with the splendid turnout you have given me this evening. When I looked at you and saw how you stood to attention and the admirable way in which you marched past, I saw that your work since you were formed, a very few months ago, has been performed with a will, and I can honestly say that I have never seen better results than you have shown me to-day.

"What pleases me still more is the splendid example you young gentlemen are showing to the whole of Canada. You have come forward at a moment when every man that is able to do anything to help the Empire in a time of stress is needed, and you have done so readily and in a most efficient manner.

"As an old soldier and as Governor-General of Canada, I wish to say that no parade that I have seen—and I have seen many lately—has given me more satisfaction than your parade this evening."

THE WOMEN STUDENTS.

At the same time the women students of the University have shown their determination to be of service by occupying the hours from four to six in the afternoon, when there is no instruction given in the University, with sewing and other work for the Red Cross Society.

PERSONAL PAGE

DR. R. R. WALKER of Bolton, Ont., was married on Saturday, January 16th, 1915. Congratulations!

Dr. G. H. Campbell has been elected Mayor of Orangeville for the second term.

The recent conviction of Dr. C. S. Schilling for practising dentistry in Saskatchewan without a license has been upheld by Chief Justice Haultain. In the course of his judgment the Chief Justice stated that the affair, to his mind, was an attempt on the part of a Manitoba dentist to reap a little benefit by allowing an unqualified man to evade the law under cover of his name. In any event there was no evidence that the Manitoba dentist was licensed to practise in Saskatchewan.

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SUBSCRIPTION PRICE - \$1.00 PER YEAR.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, 229 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to the Publishers, Oral Health, 229 College St., Toronto, Canada.

Vol. 5

TORONTO, FEBRUARY, 1915

No. 2

EDITORIAL

A Serious Problem

IT has been estimated that less than twenty per cent. of the people give proper motion to the tooth brush. To bring the matter nearer home, how many of our own patients give proper daily care to their teeth? Do twenty per cent. of our patients brush their teeth intelligently and efficiently? Does the dentist himself practise efficient prophylaxis?

An honest answer to these questions and a desire to correct the reproachful conditions that now obtain will revolutionize many a dental practice. It will attach increased importance to dental advise and fix a proper fee for the same. It is true that generally speaking, patients have not been educated to pay the regular fee for an hour in the dental chair, devoted to a discussion of susceptibility and immunity to dental caries and the many factors influencing the same. But why not? From the health standpoint, from the purely

dental standpoint or from the economic standpoint, an hour so spent gives the patient more real value than an hour spent in ordinary operative procedure. In cases where such advice is necessary and doubt exists as to the patient's attitude toward the charge of a proper fee, it is best to state frankly at the outset the need for counsel and advice and that a charge would have to be made for the time so spent. It is much more logical to charge a fee for instruction in prevention of caries than to await the results of the lack of hygienic methods and charge a fee for the replacement of the lost tissue with gold or porcelain.

To what effect is all our public oral hygiene work if the individual dentist does not personally, and in his practice, carry out approved methods of oral prophylaxis? This is one of the most serious problems facing the dental profession at this time. The Oral Hygiene Movement has made wonderful progress. Educational and Health Boards have taken up the movement with avidity. The press has shown itself progressive and ready to publish all oral hygiene material of interest that is submitted. Has the dental profession kept pace with the developments? The dentists have shown themselves strong advocates of oral hygiene in the abstract, but are they actually lagging behind in the practical application of oral hygiene?

The technique of prophylaxis is one of the most important operations in dentistry, and yet is the one least considered. Every operator follows his own particular procedure. Would you not appreciate knowing how other dentists put oral hygiene into practice and their technique of prophylaxis? If so write the editor of Oral Health and describe briefly your methods. Your name will not be used if you so desire. Please don't sit back and expect your neighbor to do this. We want to hear from many men, and the publication of these replies will be of the greatest service to the dental profession and the oral hygiene movement.

IN one week six requests came to us for information suitable to present to School Boards in urging the claims of dental clinics, etc. It is to be regretted that men who have shown interest in the movement have not made a systematic effort to provide themselves with this material. The professional literature for the past few years has been full of it. There is a way in which this, as well as other valuable material, will be always at hand. Subscribe for the best of

the dental journals, save your copies and have them bound. For a trifling cost you have, then, volumes which will be a ready source of help and inspiration. The addition of a few volumes each year will soon build up a creditable dental library. Do it at once for 1915.

Oral Sepsis and Children's Diseases

THE relationship of oral sepsis to many diseases has been well substantiated. The most eminent and scientific authorities in both the medical and dental professions have agreed that a definite connection exists. There is no group of diseases, however, in which the connection is more marked than in the group known as children's diseases.

There are certain well-defined facts in connection with the common infectious diseases of childhood. The focus of infection in all cases is in or near the mouth. It is recognized that the infection is carried in the secretions of the mouth, nose and throat. The prevalence of these diseases is very much reduced when the schools close for the summer vacation, and increases when they open again in the fall. These diseases occur as a rule in childhood during the period in life when, owing to neglect, the mouth is in the worst possible condition.

It is also a significant fact that during childhood there are conditions obtaining in the mouth that are peculiar to that period. The physiological resorption of the roots of the deciduous teeth is responsible for the fact that at all times during the shedding process there are open apices of roots in the mouth of the child. When caries reaches the pulp chamber, in such cases, there are direct openings from the mouth to the tissues at the apices of the roots, open avenues of infection. The same condition is found in the first permanent molars, where decay has reached the pulp chamber before the completion of the roots.

We have, then, in the mouths of the majority of children a combination of conditions which does not obtain at any other period in life—a neglected, filthy and diseased condition of the teeth and mouth, accompanied by direct avenues of infection leading to the deeper tissues.

It is a reasonable deduction that the prevalence and spread of the infectious diseases of childhood are due directly to the general condition of children's mouths, and

this view is held by a number of eminent health authorities.

It has remained, however, for Dr. Keyes, a member of the dental profession of Boston, to collect statistics which prove the point conclusively. In St. Vincent's Orphan Asylum in that city the average number of cases of infectious disease, per year, was about 103. A dental clinic was established in November, 1910. The results bear out what in theory seems reasonable, infectious disease has been eliminated from the Asylum. There has been no more valuable contribution to the subject of preventive medicine than the publication of the following record by Dr. Keyes:

RECORD IN REGARD TO INFECTIOUS DISEASES.

ST. VINCENT'S ORPHAN ASYLUM, BOSTON.

Showing Remarkable Decrease After Dental Treatment.

A Dental Clinic was Established in November, 1910.

			Nov. 1909	Apr. 1910	May 1911	May 1912	May 1913
	1907-1908	1908-1909	Nov. 1910	Apr. 1911	May 1912	May 1913	May 1913
Diphtheria	6	2	1	0	0	0	1
Mumps	8	3	10	4	0	0	0
Scarlet Fever	17	8	12	8	0	0	0
Pneumonia	3	5	4	6	0	0	0
Measles	24	50	40	25	0	0	0
Tonsilitis	19	16	8	3	0	0	0
Whooping Cough	7	2	2	0	0	0	0
Chicken Pox	15	17	10	6	0	0	0
Typhoid	0	0	0	0	0	0	0
Croup	4	0	0	0	0	0	0
Spinal Meningitis	0	0	0	0	0	0	0
Scarlatina	0	0	0	0	0	0	0
Bright's (Acute)	0	0	0	0	0	0	0
Hemorrhage	0	0	0	0	0	0	0
Tuberculosis of Eye...	0	0	0	0	1	0	0
Tuberculosis of Lungs	0	0	0	0	1	0	0
	103	103	87	52	2	0	7

The single case of diphtheria recorded in the last column occurred in a new girl. Examination of her mouth showed great need of dental treatment. One of the six cases of measles was contracted before or immediately after admittance to the Asylum and spread to five other children.

WE don't want to lose you,
But we think you ought to go,
For your king and your country
Both need you so;
We shall want you and miss you,
But with all our might and main
We shall cheer you, thank you, bless you
When you come back again.

—Paul A. Rubens.



CAPTAIN CHAS. A. CORRIGAN
of Toronto.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION" AS WELL AS THE "POUND OF CURE"

VOL. 5.

TORONTO, MARCH, 1915

No. 3

Dental Amalgam Alloys

THOMAS COWLING, D.D.S.,

Professor of Metallurgy, Royal College of Dental Surgeons.

THIS subject, though a very much discussed one, still holds the interest of all students of dentistry. In a sense every practitioner is still a student in view of the fact that he constantly strives to learn new and better methods of service. To no class, professional or otherwise, does the study of the metals appeal more than to members of the dental profession, whose everyday work consists in adapting at least a few of the metals to uses beneficial to those seeking their services. It might reasonably be expected that dentists should become as familiar with the properties of the metals used as they are with the virtues of the drugs which they administer. The importance to dentists of the study of metallic alloys is very evident when one considers the limited use of pure metals as compared with the extensive use of alloys of the metals.

TERMS DEFINED.

The word "alloy" is thought to be derived from the Latin "alligo" (ad ligo), "to bind together." Many definitions have been given, among others that of E. F. Law, who states that an alloy is "a coherent metallic mass produced by intimate mixture, whether by fusion or otherwise, of two or more metals or metallic substances." It is to be noted that such a mixture need not necessarily be brought about by fusion alone, because this result may be obtained also by compression, diffusion, electro-deposition, etc.

An "amalgam" we understand to be an alloy of two or more metals, one of which is mercury. In effect, then, an amalgam is an alloy. In order to clearly differentiate terms we speak of the dental alloys used for amalgamation as

dental amalgam alloys. Such alloys stand distinct from others, such as iridio-platinum alloys, etc. The popular expression "alloy" signifies depreciation, but from the standpoint of the metallurgist it signifies an endeavor to produce a new metal whose properties shall be superior to those of the constituent metals used.

THEORIES—CHEMICAL VS. PHYSICAL.

Space will not permit of discussion of the old, and as yet unsolved, question whether alloys are chemical compounds or mechanical mixtures. Those holding to the physical theory affirm that alloys are most likely solid, cold solutions of two or more metals with each other and may, without regard for their atomic relations, be varied in percentage. Supporters of the chemical theory maintain that the combining ratio of the metals is their atomic ratio—a chemical equivalence—and that only in this way is it possible to obtain a balanced alloy. Much may be stated in support of both theories.

FORMULAE—SET VS. PROPORTIONAL.

Many authorities hold that good results in an alloy are hard to obtain when using a "set formula," because of differences in the purity of the metals used at different times. A sort of "proportional formula" is devised which varies with each test batch until desirable results are obtained. Advocates of this method point out that it is difficult to obtain pure metals and that impurities aggregating from $\frac{4}{10}$ to $\frac{1}{2}$ of 1 per cent. are bound to prove injurious to the final alloy. To ascertain defects in the alloy so prepared, test batches are subjected to the scrutiny of micrometer and dynamometer. Any imperfections are corrected by altering the constituents of subsequent batches.

Others, however, hold closely to the practice of having a "set formula," because they claim that it is possible to obtain metals of such purity as to render any defects in the final alloy negligible. Bar silver of a fineness of 999.5 to 999.7 is commercially obtainable. Copper (electrolytic) has a fineness of 999 plus, while tin comes in a purified state of even better than 999.5 fineness. Metals of such a degree of purity will give to an alloy qualities of a high order and not add greatly to the cost. Care must be taken to obtain copper entirely free from lead—a metal with which it is commonly found associated.

A brief consideration of some of the difficulties encountered in preparing alloys will serve to show that the production of a high grade alloy is accomplished only by skill and

DIFFICULTIES IN ALLOY MAKING.

experience. It is not to be expected that inexpensive alloys will contain all the desirable qualities required in filling materials.

Mixing.—When two or more metals are being melted together it is necessary to keep them intimately mixed so that there will be little indication of separation according to their densities. This calls for some method of keeping the mixture well agitated. To obtain a mixture of a uniform composition it is often necessary to melt and remelt the ingot.

The difficulty increases as the melting points of the constituent metals differ, or if one metal is volatile. Many devices are resorted to in order to obtain good results under such conditions, as for example:

In preparing German silver, the constituents, copper, nickel and zinc, have the following melting points: Copper 1,065 degrees (in air), nickel 1,451 degrees, and zinc 419 degrees. In attempting to melt these three metals together it is hard to prevent the burning of the zinc before the melting point of the nickel is reached. To avoid this an alloy of copper and zinc (brass) is first prepared. The melting point of the zinc in the zinc-copper alloy is thus raised. Then an alloy of the copper and nickel is prepared. The melting point of the nickel in the nickel-copper alloy consequently is lowered. Now, having in these preliminary alloys brought the melting points of the extremes (nickel and zinc) more nearly together, a final alloy is made from these previous two. The final result will consist of all the constituents in the desired proportions.

In the process of melting there is great liability of the metals becoming oxidized. To prevent this metals are melted in a graphite crucible and covered with charcoal. A protecting layer of borax may also be used to advantage. If the mix be stirred with a green pole, gases are evolved from the wood which aid in reducing the oxides present. A deoxidizing agent may be used. It must have a greater affinity for oxygen than for the metal to be deoxidized, and should be used in such quantity only as will bring about the desired reaction. An excess of the deoxidizing material will prove injurious to the alloy. It has been suggested by Edward F. Law that a suitable deoxidizer for aluminum alloys is magnesium, used pure; for silver-copper alloys, cadmium, used pure; for German silver, magnesium, used in the form of cupro-magnesium.

Pouring.—Care must be taken when pouring the alloyed

mass. The exact temperature at which to run the alloy is determined previously by careful tests. A condition of uniform distribution of the constituents must obtain when the mass cools. Alloys poured at too high a temperature possess the coarse structure shown in the slowly cooled metal. If, however, the mixture is run at too low a temperature it solidifies as soon as it reaches the mould and there is not the proper cohesion in the ingot. In a mix of insufficient fluidity, deleterious matter, such as scum, slag, etc., will be enclosed in the ingot owing to inability to reach the surface of the fluid mass, and so result in an unsound ingot, which cracks when rolled. To obtain good results the mass before pouring should be heated sufficiently high so as to have solidification commence only after the mould is completely filled with the molten metal.

Cooling.—A factor of great importance in alloy making is the rapidity or slowness with which the mass is allowed to cool. Generally speaking, slow cooling produces a large grained, coarse, and relatively weak alloy, while rapid cooling gives a fine structure and a stronger but more brittle alloy (Law).

After Treatment.—It has come to be recognized that the after treatment of alloys is a very important factor in their efficiency. Thermal treatment, such as heating, tempering, etc.; mechanical treatment, such as rolling, drawing, cutting into shavings or filings; chemical treatment, such as pickling, etc., all effect the molecular readjustment which takes place in the alloy. It has been ascertained that too much annealing of the alloy causes a subsequent shrinkage in the amalgam.

EXAMINATION OF AN ALLOY.

It is possible to examine an alloy so as to learn something of its suitability for various purposes.

The Microscope aids in such an examination. Metallography has become an important branch of study. The alloy for examination is fractured and scrutinized under the microscope to ascertain the crystallization, density, homogeneity, etc., of the fractured surface. Another method of microscopic examination is to expose a polished surface of the alloy to the influence of etching acids and then view the surfaces to ascertain the relative solubility of its parts.

The Micrometer tests the amount of shrinkage, expansion, etc., in dental amalgam alloys. In this case a steel test cup of known capacity is filled with an amalgam and placed

in contact with a spindle connected with the reading dial upon which is registered the slightest change of the amalgam, either of contraction or expansion.

The Dynamometer. This instrument is capable of registering the crushing strength of an ingot of amalgam. It also registers the amount of flow.

INFLUENCE OF METALS ON THE AMALGAM.

A consideration of amalgam naturally involves a statement of the influences exerted by the metals used in such amalgam. Reviewed briefly, these are:

Silver.—The action of silver and gold in an amalgam is fairly well understood in view of the long-established practice followed in mining operations—the amalgamation process for the extraction of these metals from their ores. Silver and mercury combine readily to form a definite chemical compound corresponding to $\text{Ag}_2 \text{Hg}_2$ (Bloxam) or $\text{Ag}_2 \text{Hg}$ (Joulé). This metal forms the basis of dental amalgam alloys. If uncontrolled by alloying with other metals, it expands freely. Its qualities, when in combination with mercury, of toughness and beauty of color, make its use in dental alloys paramount.

Tin.—In combination with silver an alloy of good color is produced. The hardness of the mass is also increased, although tin itself is a fairly soft metal. The objection to its use in alloys is due to its quality of shrinkage. The more tin present in an alloy the more easily will such alloy amalgamate, so that it is not always the well-balanced alloys that amalgamate with facility; indeed quite the contrary is the case.

Copper.—Copper and mercury do not amalgamate readily. Considerable objection to the use of this metal in dental alloys has been raised in some quarters. This is due, no doubt, to the fact that impurities are not eliminated from the copper before alloying. Copper exhibits little tendency to expansion or contraction on hardening and imparts edge-strength to the filling.

Zinc.—This is a difficult metal to alloy uniformly with other metals. After pouring out the melted mass it is usual to find the alloy unevenly balanced. For this reason, no doubt, many disfavor the use of this metal in dental alloys, even in small quantities. When alloyed with care, however, zinc aids materially in resisting the flow of the amalgam and may be used to complete the balance between the expanding silver and the shrinking tin contents.

PURE MERCURY NECESSARY.

No matter how carefully an alloy may be prepared, desirable results in the finished amalgam filling will be unattainable if impure mercury be used. Commercial mercury frequently contains impurities such as tin, zinc, lead and bismuth. If these impurities are allowed to remain the balance of the alloy will be spoiled.

IMPURITIES OF MERCURY.

Mercury, when impure, has a dull appearance, forms imperfect globules, is deficient in mobility, darkens the inside of glass containers and leaves black tracings when rolled on white paper.

Bismuth causes the amalgam to darken and also impairs its edge-strength. Care should be taken to entirely eliminate this metal. To detect its presence, drop a nitric acid solution of the mercury, prepared without heat, into distilled water. The sub-nitrate of bismuth is formed if that metal be present.

Lead. The smallest portion of this metal will spoil the qualities of the amalgam. To detect its presence, shake up the mercury with equal parts of acetic acid and distilled water. Test part of this solution with sulphate of sodium (Na_2SO_4) and part with potassium iodide (KI). In the presence of lead the former reagent will produce a white and the latter a yellow precipitate.

PURIFICATION OF MERCURY.

As lead is the most undesirable impurity of the mercury, steps should be taken for its removal. Cover thin layers of the mercury with a solution of nitric acid diluted with twice its volume of distilled water. Stir frequently and put aside for two days. The lead, being more soluble than the mercury, passes into solution. Pour off the supernatant liquid which contains the lead and a small quantity of mercury, wash the remaining mercury with distilled water and dry by means of blotting paper and gentle heat. If necessary resort to redistillation.

KEEPING MERCURY PURE.

It has been suggested that, in order to keep the mercury pure, it should be kept covered with alcohol in a well-stoppered bottle. The mercury is drawn off through an opening at the bottom of the container. By this method the contents of the vessel are not exposed to the atmosphere.

AMALGAM MIXING.

Modern dentistry with its perfection of technique has

superseded in no uncertain way the dentistry of yesterday, crowded as it was with guesswork and uncertainties. To-day even our investment materials, which we used to mix haphazardly, are proportioned carefully, so that the operator may obtain good results. Is it asking too much then that we discard the old custom of mixing amalgam by guesswork and substitute therefor a method involving the use of proportional scales and a mixing vessel? Such a change in method will result in a saving both in alloy and mercury and produce a uniform amalgam.

HAND METHOD.

There are different methods in use by dentists for mixing amalgam. The least desirable one is that of mixing in the hand. The objections to this method are several:

1. It does not bring about a very intimate mixture.
2. It is not clean or sightly.
3. The amalgam becomes contaminated with portions of cuticle and moisture from the hand.
4. The mercury enters the pores of the skin, is difficult to remove, and so alloys with any gold handled subsequently by the operator.

MORTAR AND PESTLE.

The use of a mortar and pestle to mix the amalgam is superior to the hand method in that it is clean and brings about good mixture. Objection has been raised to this method, however, in that it predisposes to a condition of crystallization of the amalgam before it is inserted in the tooth cavity.

etc.? The manufacturer has done his part exceedingly well. Now let the dentist co-operate. Care in cavity preparation so as to prevent spheroiding of the filling; the use of sufficient pressure to insure adequate condensation; time spent in carving and polishing—all these are needed to bring due recognition to this much abused and misunderstood filling material.

RUBBER CUP.

A third method and one free from the objections of the previous two might be used to advantage. This involves the use of a rubber cup. An ordinary rubber finger guard answers the purpose admirably. The alloy and mercury having been proportioned, are emptied into the rubber receptacle and amalgamation is brought about by finger pressure.

PACKING AND CONDENSING.

The amalgamated mass is inserted in the tooth cavity in pieces large enough for ease in manipulation. The more

plastic portion of the amalgam is inserted first and pressed against all surfaces. (A pledget of cotton pressed against the amalgam forces it into all areas of the cavity.) The remainder of the filling is built up upon this and packed with serrated instruments of sufficient size not to break up the continuity of the filling.

FINISHING.

Needless to say, all carving of surfaces of the filling must be done before crystallization is completed. Surfaces are well polished so as to leave no areas suitable for attachment of plaques, etc.

A feeble effort has been made in this article to point out the difficulties encountered in producing an alloy. The well-balanced amalgam alloy is the product of much skill and experience. Dental operators are greatly indebted to the manufacturers for having produced such a satisfactory filling material. Do dentists help in obtaining the best results? Is it not possible that they really discount the results obtained by careful and scientific manufacture when they disregard imperative instructions as to proportional mixing.

Description of Various Splints for Fractured Jaws

THE Hammond or Interdental splint is a wire splint which fits accurately around the teeth, both on the labial and lingual sides. After being pushed over the teeth, the splint is bound in position by iron wire passing between the teeth. This splint may be made of German silver.

The Hayward or Kingsley splint is composed of a vulcanite cap which fits accurately on the teeth, from the sides of which two wings project so that, when the vulcanite cap is in position, the wings lie outside the mouth, one on each side, stretching back as far as the posterior border of the rami.

The Gunning splint consists of two vulcanite caps, one fitting on the maxilla and one on the mandible, these two caps being joined by anterior and posterior pillars.

Angle's splint. The first molars are banded with bands similar to ordinary regulation bands. The canines are also banded, the two jaws being fixed in occlusion by ligating the molar bands and canine bands together by a figure of eight ligature.—*E. E. Spencer, British Dental Journal.*

The Anesthetization and Devitalization of Pulp, Their Removal and Subsequent Treatment

J. R. DOYLE, D.D.S., PORT ARTHUR, ONT.

IN presenting this paper this evening, I do so with a feeling of presumption, especially when I consider that this particular subject is one that gives us as much, if not more trouble, than any other in Operative Dentistry, and again, when I consider that I am only a recent graduate, without sufficient experience to tackle a subject of this nature. I do so, however, gentlemen, with a two-fold object in view:—

FIRSTLY: That, in addition to a few new points which I hope to bring to your minds, I will refresh your memories with many old ones.

SECONDLY: That I will create a lively discussion among those present.

WHEN SHOULD THE DENTAL PULP BE REMOVED?

In answer to this question, I would say when it cannot possibly be saved by capping or otherwise. Now arises the problem, when shall we cap the pulp, and when shall we remove it?

We are justified in capping a pulp under the following conditions:—

(1.) In an accidental exposure in preparation of a cavity, provided the injury is not too great and the cavity has been properly sterilized. The majority of older practitioners, however, say it is impossible to save a pulp when it is once exposed, by capping with any capping material known at the present time.

(2.) Where the pulp is not too highly inflamed, not having reached the stage of passive hyperemia, or where there is no evidence of degeneration and no pulp is exposed.

(3.) In cases where root of the tooth is not fully developed, as in young patients, we should do our best to save the pulp.

(4.) When we use Dr. Buckley's Desensitizing paste in the teeth where there is no degenerative changes in the dental pulp.

*Read before the Thunder Bay Dental Society February 20th, 1915.

The condition of the mouth and the daily care of the teeth is a factor to be taken into consideration before proceeding to cap a pulp. We may not always succeed in saving the pulp by capping, but we should at least try in the cases indicated, and we should have a frank understanding with the patient as to the possibility that we may fail.

DR. J. P. BUCKLEY'S DESENSITIZING PASTE.

If you will allow me, gentlemen, to break away from my text, I will endeavor to explain, to you men who may not be familiar with it, this great discovery, namely, Dr. Buckley's Desensitizing Paste, which, in my opinion, is a Godsend to dentistry and a blessing to humanity.

This desensitizing paste, as it is called, is the result of many months of experimenting by Dr. J. P. Buckley.

The formula is as follows:—

(a) *Neothersin*: a new synthetic product possessing marked local anesthetic properties, occurs in white, fully soluble powder, and is rapid in action. 11 parts.

(b) *Thymol*: a crystalline compound obtained from the volatile oil of *Thymus vulgaris*. It occurs in large colorless crystals, practically insoluble. It is a penetrating drug and has marked disinfectant properties. 12 parts.

(c) *Trioxymethylen*: is a product formed from the polymerization of formaldehyde. It is a white powder, practically insoluble, stable at ordinary temperature, but at body temperature slowly gives off formaldehyde. 77 parts.

The three named are combined with a petroleum base and incorporated in a fibrous vehicle and colored with an insoluble pigment. One grain is sufficient for fifteen applications. Price \$5.00 for one-eighth of an ounce.

ACTION.

Neothersin applied directly to exposed dentine paralyzes the exposed sensitive dentinal fibrillæ.

Thymol volatilizes and permeates the softened dentine.

Trioxymethylen: Formaldehyde is liberated at body temperature from Trioxymethylen, which gas diffuses through the decayed dentine, combining chemically with amine group of the protein constituent of the dentinal fibrillæ. It also acts upon certain intermediate and end products that may be present in the carious tooth structure, as a result of albuminous decomposition, and this agent, together with the thymol, brings about complete sterilization. Thus the dentine affected by this remedy is not only desensitized but sterilized as well.

(1). The remedy is sealed in a cavity for 24-48 hours.

It may be sealed longer without doing any harm.

(2). The remedy will not affect the sound dentine to any dangerous depth or devitalize the pulp.

(3). Sensation will return to the dentine in a week or ten days.

I have found that upon three different occasions the paste made the teeth ache, due, in my opinion, to the formaldehyde being liberated, irritating the almost exposed pulp, but the aching quickly subsided upon applying *Aromatic Spirit of Ammonia* on a pledget of cotton. After a moment or so the cavity may be dried and an anodyne dressing sealed therein, or the pulp may be removed, according to the operator's judgment.

I might say in conclusion, gentlemen, that this paste has been used and highly endorsed by such leading American dentists as Dr. Ottolengui, of New York; Drs. Har. Goslee, F. Roach, M. Gallie, C. N. Johnston, of Chicago, and others; also that great care be exercised in using it only in such teeth where there is no pathological condition of the pulp. A more complete account of this remedy is given by the discoverer, Dr. J. P. Buckley, in *The Items of Interest*, December, 1914.

WHAT SHOULD WE USE TO CAP A PULP?

I have found best results in using Smith's copper cement. Mixing a small amount of creosote with liquid before mixing with powder and sealing into cavity without pressure.

WHEN SHALL WE REMOVE THE PULP?

(1). Dental Caries.—When we have invasion of pathogenic bacteria and absorption of ptomains.

(2). Mechanical Irritation—In certain cases of abrasion, thermol changes, close proximity of metallic fillings, injudicious regulating and extensive grinding.

(3). Calcific deposits or pulp nodules within the pulp itself.

(4). In certain cases of crowning and filling large cavities.

(5). In certain cases of pyorrhea alveolaris, or, as it is properly called, peridontiaclasia.

FACTORS TO BE OBSERVED IN REMOVAL OF PULP.

(1). Establish and maintain asepsis in performing the operation.

(2). Preserve the color of the tooth.

(3). Thoroughly fill the root canals.

METHODS.

First,—*Anesthetication.*

(a) Pressure anesthesia.

(b) Local hypodermic injection of novocaine around and about the apex of the root of the tooth.

(c) General anesthesia by N_2O O.

(d) Crown amputation.

(A) I have had good satisfaction and results with pressure anesthesia in anterior teeth, and in some cases posterior teeth, but better results with anterior teeth. As you are all familiar with technique, which is simple, it will not be necessary for me to dwell upon it.

(B) Local hypodermic injection of novocaine around root. I have not used this method sufficiently to justify me in either advising or denouncing this procedure.

(C) N_2O+O Anesthesia. A successful method in the hands of an operator who is familiar with the N_2O+O anesthesia. The patient must be well under. Never under any circumstances remove a nerve when patient is in the analgesic stage.

(D) Crown Amputation. This method is used only in cases of anterior teeth where the decayed crown is removed to be replaced by an artificial crown.

TECHNIQUE.

With a knife-edged stone in straight handpiece of dental engine, make a niche on the labial gingival portion of the tooth and also on the lingual gingival side as deeply as possible without causing too much pain. Then with a pair of cutting forceps nip off the crown. Before doing so have a root canal drill in the engine to enlarge opening of pulp chamber, and a small sterile barbed broach ready to remove the nerve. The shock caused by the cutting off of the crown completely anesthetizes the pulp, and it may be removed without any pain whatever, provided that it is removed immediately. This may appeal to some of you, who may not be familiar with the technique, as a barbarous and cruel procedure, as it did to me when first I heard of the method, but I would advise you, gentlemen, to try it and be convinced otherwise. It is the quickest way of removing the pulp that we have.

Where pulp has been removed by any of the above methods there is more or less hemorrhage. In every case the blood in the cavity and the canal should be thoroughly removed in order to preserve the color of the tooth. In doing this, serious blunders have been made in using such drugs

as H_2O_2 . Now this drug should never be used for this purpose, because it decomposes the blood, oxidizes the iron of the hemoglobin, and gases evolved in the decomposition force this pigment into the dentinal tubules, which will cause the tooth to darken in almost every instance. To remove the blood from the canal and cavity, the following may be used:

- (1). Sterile water.
- (2). Alcohol.
- (3). Saline Solution.
- (4). Listerine solution.

A root canal should never be filled at the same sitting that the nerve is removed, for the following reasons:

(1). In pressing cocaine into pulp we oftentimes press it beyond the apex, thus anesthetizing that area. If we then endeavor to fill the root we may push the root canal filling beyond the end of the root without knowing it.

(2). The tearing away of the pulp at the apex of the root causes more or less irritation, and a few days should elapse in order to give nature a chance to adjust this condition.

(3). We sometimes have a secondary hemorrhage ensuing with the formation of a clot at the apical area causing soreness, in which case greater comfort can be given the patient by proper treatment through root canal than by counter irritants.

You will note, gentlemen, that I have made no mention as yet of the use of rubber dam. Pressure anesthesia, generally speaking, is used in the anterior upper and lower teeth, and it isn't necessary to use the rubber dam, but the operator must use a sterile saliva ejector, cotton rolls and packing. The mouth must be first thoroughly rinsed out with antiseptic solution, sterile saliva ejector and cotton rolls adjusted, and then the tooth and adjacent gums should be sterilized with warm absolute alcohol and dried with warm air.

Second—*Devitalization*.

This method is the one most commonly used.

Agents used:

(A) Arsenic Trioxide (As_2O_3) Buckley's and S. S. White Arsenic Fibre.

(B) Arsenic Pentoxide.

(C) Arsenic Trioxide and Cocaine Hydrochloride.

ADVANTAGES OF THE PENTOXIDE OVER TRIOXIDE.

(1). It is not as toxic as trioxide.

(2). It will not make the tooth ache if sealed in care-

fully. It can be applied on highly inflamed pulps without causing the tooth to ache.

(3). It can be left in the tooth for a considerable time without causing bad consequences.

DISADVANTAGES OF PENTOXIDE.

(1). It is difficult to seal into a cavity on account of its constituency.

(2). It requires twice the dosage.

(3). It is very slow in its action.

(c) Arsenic trioxide and cocaine hydrochloride may be mixed together in whatever proportion the operator desires with some such vehicle as creosote. Roll up a pledget of cotton and saturate it with this mixture and apply to cavity. Seal without pressure. Operators who use this method claim that it will not make the pulp ache, even if applied to an aching pulp it will cause pain to subside almost immediately.

APPLICATION OF ARSENIC.

(1). Break down the overhanging enamel walls with a chisel.

(2). Remove as much of the decay as possible without causing too much pain.

(3). Wash out well with tepid water or antiseptic solution in spray bottle.

(4). Try to remove all decay from gingival, mesial or distal, as case may be, so as to allow cement to be sealed hermetically at this point, thus preventing arsenic escaping on the gum.

(5). If there is any overhanging gum, cauterize with trichloroacetic acid or some such drug, or with an electric cauterizer, and remove it. If you cannot remove the gum in this way, put an anodyne in cavity and pack gum back with temporary stopping, allowing the patient to bite on it slightly.

(6). In cases where the pulp is highly inflamed, I would recommend arsenic pentoxide or arsenic trioxide and cocaine hydrochloride, or any anodyne such as creosote or eugonal might be sealed in for a few days until inflammation subsides, and then apply whatever devitalizing agent you deem advisable.

In cases where the pulp is exposed, I always roll a few threads of cotton around arsenic trioxide fibre when I use it, and moisten it slightly with creosote. The cotton acts as a cushion and helps to prevent pressure; the creosote acts as an anodyne. Use cement *always* to seal in arsenic. Mix it thin and flow it over the arsenic, avoiding pressure.

The pain caused by application of arsenic is due, in my opinion, to two reasons:

- (1). Pressure.
- (2). Too large an amount of arsenic being used.

HOW LONG SHOULD ARSENIC REMAIN IN A TOOTH?

It depends on whether you use the trioxide or pentoxide. As I mentioned before, the pentoxide is slower in its action on account of its being less toxic. Other factors which govern the length of time an application should remain in a tooth are:

- (1). Age and general condition of patient.
- (2). General condition of pulp itself.
- (3). Amount and condition of dentine between pulp and application of paste.
- (4). The climate or season of the year.

Personally I cannot say that I found that this has any effect upon action of the arsenic.

TECHNIQUE OF INITIAL OPENING AND PREPARATION OF CAVITY.

(1). Spray the mouth well with some good antiseptic mouth-wash.

(2). Remove the cement and arsenic dressing and prepare the outline form of the cavity by the method recommended by Dr. Black. Remove all the decay and cut away all tissue which prevents a clear view of every aspect of pulp chamber.

(3). Remove as much dentine as possible over pulp chamber with a round burr, until, for instance in molar, the four horns of the pulp can be seen through dentine. Now at this point wash the mouth again and also the cavity with antiseptic solution in spray bottle. Apply rubber dam if required or use sterile saliva ejector and cotton rolls.

(4). Sterilize tooth cavity and gum and adjacent teeth with warm absolute alcohol, and dry. The alcohol may be heated, touching a pledget of cotton dipped in alcohol to the alcohol lamp flame, blow out flame in about half a minute and apply as directed.

(5). With a spiral leaf burr, similar to the one which I shall pass around, either in straight handpiece or right angle, depending on location of cavity, start at one horn of the pulp and cut right around to the pulpal wall. You will notice, gentleman, that this burr is so constructed that it will not interfere with the pulp, and hence will not cause any pain, and again, it will not mar the floor of the pulp chamber.

(6). Remove the contents of the pulp chamber with a

sterilized sharp excavator.

(7). Make the walls of the pulp chambers and the walls of the cavity continuous. Sacrifice tooth structure if necessary.

(8). Wash out pulp chamber and the cavity with warm alcohol and dry thoroughly with warm air.

If you find some vitality in the pulp or root canals seal in on a pledget of cotton a mixture of campho-phenique cocaine and a small amount of arsenic trioxide powder, depending on case, and leave for about a week.

SURGICAL REMOVAL OF THE DENTAL PULP.

(1). Pass sterile barbed broach, extra fine, as near as possible to the apical end of the canal along the side of the root canal, rotate slowly and carefully, remove quickly.

(2). Do not use a large barbed broach, especially in a small root canal, because it forces the tissue into or through the apical foramen. Personally I use extra, extra fine broaches in all cases, with good results.

When all the pulp tissue has been mechanically removed, there still remains the fibrils of the pulp and proto plasmic contents of the dental tubules. This organic tissue must be removed in all cases.

There are three methods known to me:

(1). Sulphuric acid and sodium bicarbonate, the technique of which you are all familiar.

(2). Schrier's Na+K, a combination of two alkaline metals, sodium and potassium, a bluish white paste with metallic lustre and contained in capillary tubules, the technique of which is well explained by Dr. Fred Burden of Moncton, N.B., in *Dominion Dental Journal* of January, 1915, and to whom I am indebted for points herein mentioned.

(3). By the use of the Gates-Glidden drill. This method is the one adopted by me.

THE TECHNIQUE OF THE REMOVAL OF THE ORGANIC REMAINS OF THE PULP AND THE PROTOPLASMIC CONTENTS OF THE DENTAL TUBULES, BY THE USE OF THE GATES-GLIDDEN DRILL.

The technique is as follows:

(1). Use large sterile drill first and then smaller as apex is reached, the reverse of what the manufacturers tell you.

(2). Do not ream out too much at a time, in case the drill might not follow the root canal. Work drill up and down, using very little pressure. After each time remove

loose tooth structure with compressed air and sterile barbed broach, and work barbed broach into root canals, feeling your way in order to make sure that the drill is following the right course. Do this frequently during operation. Keep drills in solution of lysol. Use small sterile barbed broaches first and then coarser ones. The best sizes and makes of Gates-Glidden drill to use are S. S. White 174, 175, 176, 177. Other sizes may be used, however.

COMPLICATIONS.

Tortorous root canals.

Ream out root canals (about two-thirds), then use Kerr broach and barbed broaches to remove the remainder, or Schrier's Na+K may be used.

(3). Wash out root canals and pulp chamber with H_2O_2 or alcohol, or better, with following, suggested by Dr. H. E. Burden:

Hydrogen Peroxide (Marchand's),

Hydrargyri bichloride, gr. $1\frac{3}{4}$.

This makes about 1-500 per cent. solution and coagulates albumins and carries off contents by gaseous expansion. Repeat this procedure and again flood the field by capillary attraction with same solution until no further action takes place and solution is clear.

(4). Dry thoroughly and wash root canals, pulp chamber, cavity, tooth and rubber dam around tooth with warm absolute alcohol. Seal in some campho phenique into root canals and a few threads of cotton, especially if there is any soreness at ends of roots, and leave about three days. In the majority of cases the root canals may be filled at the same sitting provided the above mentioned method is used. Fill roots that are not sore second sitting to prevent re-infection.

TECHNIQUE OF FILLING ROOT CANALS.

(1). Apply rubber dam if necessary. If not, use sterile saliva ejector and cotton rolls.

(2). Remove campho-phenique dressing and dry thoroughly with warm air.

(3). Flood canals with eucalyptol by capillary action; not eucalyptus, because it is too irritating.

Now a word about root canal fillings and root canal points. I earnestly corroborate Dr. J. P. Buckley's remarks when he says there is no such thing as a permanent root canal filling. It is merely a catch phrase used by manufacturers of root canal filling material to sell their product. If dentists would use gutta percha or some other kind of ma-

terial that nature would tolerate, and keep the bone and tissue at apical region healthy, and cast aside all such preparations as zinc oxide formaldehyde paste, we would be doing a great deal.

MATERIALS WHICH MAY BE USED IN FILLING ROOT CANALS.

(A). Chloro percha.

(B). Paraffin—Dr. Prinz—lower teeth only.

I use gutta percha root canal filling in all cases. Formulae:

Base Plate Gutta Percha.	} Equal parts.
C.H.C.L. ₃ (Chloroform)	
Oil of Cajaput	
Thymol	

GUTTA PERCHA POINTS.

Up to the present I do not know of any better root canal points than Canfield's. They are mild and aseptic, medicated and non-irritating, and put up in celluloid capsules. They should be used, and no other kind will do. Put the required number on a clean, aseptic glass slab.

(4). Wind a few threads of cotton around a smooth sterilized broach, dip into gutta percha and work into roots as well as possible.

(5). With a pair of sterile pliers, which should be used only in this operation, grasp large end of gutta percha point. Dip the small end of point in chloro-percha and insert in root canal, not too tightly. Mentally measure size and length of point before inserting into root canal. In some roots more than one point is required. Fill all roots in like manner. Leave for about half a minute, and when point softens slightly, with a sterile amalgam plugger, suitable size, or canal plugger, which is sterilized and used only for this purpose, force points towards the apex of each root; pack as you would an amalgam filling. If you are in doubt about point not reaching the apex, heat a fine long-pointed instrument used for this purpose and push it through root canal filling to apex, using pliers to hold filling in place when pulling it out again. Pack again with amalgam plugger, cut off excess if any, and seal with electric gutta percha instrument. Wipe out pulp chambers with cotton and eucalyptol.

FILLING WHICH MAY BE USED TO FILL PULP CHAMBER.

(1). Zinc oxychloride cement.

(2). Smith copper cement and creosote.

Personally I use copper cement. Mix a drop or less of creosote in liquid and then mix with powder. This will keep

the pulp chamber in good healthy condition. Fill pulp and build up step at the same time.

Surgical cleanliness must be carefully observed and followed in each step. The success of your operation depends upon it.

FEE.

Before concluding, gentlemen, I would like to offer a suggestion before the Society, and that is this:

That this Society set a minimum fee of so much an hour for this particular work.

I think, gentlemen, that the great failure along this line of technique is due not to ignorance as to correct methods, but to too much haste, foolishly believing that it does not pay to spend too much time on this particular part of operative dentistry.

Mr. President and fellow-practitioners, if I have been able in this paper to bring to your minds a few thoughts which may be of inspiration to you to do better work along this particular branch of operative dentistry, I shall feel amply repaid and gratified that the opportunity came to me to be of service.

Post-Graduate Course in Modern Dental Prosthetics

AS an outcome of the enthusiasm and satisfaction expressed by all the members of the class in Dental Prosthetics, held in the College Building, in Toronto, last summer, under the direction of Dr. W. E. Cummer, a new class is being formed, and is already partly filled.

The course of last year will be repeated, with much additional material, new since then, in impression work, anatomical articulation, removal, bridge and partial denture work. An important feature will be the providing of measuring and testing instruments (one of which is shown in another part of this issue), for various prosthetic materials, such as plaster, vulcanite compound, etc., and a very brief exercise designed to perfect each member of the class in the successful manipulation of these materials.

The class will be limited in number, and will begin on August 16th to August 28th inclusive, two weeks in all. Those interested would do well to send their names for a place on the mailing list to Dr. Cummer, No. 2 Bloor St. East, for information which will be released from time to time. The indications, even at this early date, are for a most successful and congenial gathering.

Operative Dentistry *

DR. A. H. HIPPLE,

Dean of Dental Department, Creighton University,
Omaha, Neb.

IN all of our colleges operative dentistry is taught in the lecture room, in the technic laboratory, and in the infirmary. In the lecture room the student is taught the principles that underlie all dental operations. In the technic laboratory he performs operations upon inanimate objects, not only for the purpose of fixing the principles in his mind, but in order that his hand and his eye may be trained as well. In the infirmary the student is taught to apply all that he has learned in the lecture room, and all the skill that he has acquired in the laboratory, to the treatment of oral lesions, under conditions approximating those of a private practice.

I believe that the instruction should be given in the order named. I believe that class-room instruction should precede the work of the technic laboratory, and that the student should be taught what he is going to do, and how he is going to do it, before he attempts any operation. I know that some of our best teachers consider that until a student has actually performed an operation, or at least attempted it, he will derive little benefit from any lecture on the subject. They tell us that students learn by doing, which is true. They tell us that students who have attempted operations and have failed will pay closer attention to a dissertation on the subject than those who have had no practical experience, which may also be true; and, acting in accordance with these ideas, it is the custom in some schools to have the students perform a variety of operations in the technic laboratory before taking up the lecture course. So eminent an authority as Dr. Black, in his monumental work on *Operative Dentistry*, recommends that Volume II., which deals with technical procedures in Filling Teeth, be given as a text-book to the freshman class, and completed during the junior year, and that Volume I., which treats of the Pathology of the Hard Tissues of the Teeth, be studied during the senior year. In other words, the treatment of the disease

*Read before the American Institute of Dental Teachers, Ann Arbor, 27th January, 1915.

is to be studied before the disease itself. As a reason for this recommendation, he says that "In order to read understandingly of typhoid fever, for instance, one must have had much practical observation of the disease." The truth of this is obvious, but it is also obviously true that unless one knows what typhoid fever is, what tissues are involved, and something about their pathology, he will not be able to observe understandingly. As a matter of fact, the more a man knows about the pathology of typhoid fever, the more he will learn from clinical observation; and the more clinical experience he has had, the better he will be able to understand its pathology. The same is true of our lecture and laboratory courses. To get the best results, in my opinion, we must carry them on together, with the class-room instruction in advance of the laboratory work. Three years is a very short time in which to give a student the theoretical knowledge and the practical training necessary to fit him for his life's work. We all realize that we ought to have four years. In order to make the most of what time we have, however, I believe that the lecture course in operative dentistry should start with the beginning of the freshman year and end with the close of the senior year, and that during that entire time the student should be doing practical work of some sort, although not necessarily of a strictly operative nature.

While the lecture course should be arranged so as to cover the ground systematically, I do not think that it should be divided in such a way that the subject matter of each year will be separate and distinct from that of the others. That method may be applicable to some of the branches of our curriculum, but not to operative dentistry. A student will absorb a certain amount of information in regard to an operation when it is first explained to him in the lecture room, but when he attempts it in the laboratory he will usually find that his knowledge is very incomplete. The next time he hears it explained he will understand it better, and when he has actually performed the operation on a patient he will be able to understand things which otherwise would be almost meaningless to him. Our teaching must be graded and adapted to the comprehension and capabilities of our students. In describing an operation to freshmen we should confine ourselves to those things that a freshman can understand, but a senior is able to appreciate instruction of an advanced character, and is entitled to receive it. Each class, in my judgment, should be handled separately, and receive its own course of lectures.

When I speak of instruction in the lecture room I do not mean cut and dried lectures, read or recited to the class. If the teacher has nothing to offer his students but a mass of facts, to be taken down in the form of notes and memorized, I think it would be better to have the student do his practical work first. What I mean by lecture-room instruction is real instruction, the kind that trains the perceptive powers of the student, that makes him think, that leads him from the known to the unknown and really educates him. Let me illustrate what I mean. Suppose we wish to teach a class of freshmen the form that is to be given to a simple occlusal cavity. We might tell them that the outline of the cavity should include all fissures, that the floor or seat of the cavity should be flat, that the surrounding walls should meet the seat practically at right angles, that the margins of the cavity should be bevelled, and so on. We might tell them these things, and we might force them to memorize the facts, but we would not be teaching them very much. I think a better method would be to proceed somewhat as follows: Ask the students what we aim to accomplish by filling such a cavity, and by successive questions, if necessary, develop the idea that we are trying to arrest decay, to prevent its recurrence, and to permanently restore the original form of the tooth. Get them to see that in order to arrest decay, and prevent its recurrence, all tissue that is affected, and all tissue that is likely to become affected must be removed; and when that is clear in their minds they will understand that all fissures must be included, and will have a very fair idea of what must be the outline form of the cavity. Next tell them that such a cavity should be given the form of a box. At once they think of packing-boxes or crayon boxes, and when someone is asked to describe a box he describes a rectangular one. Someone else is asked to suggest other forms, such as the candy boxes used by confectioners, with the result that square, round, oval and heart-shaped boxes are mentioned. A little further questioning brings out the fact that much as these boxes may differ in their general form, they all have two things in common: each has a flat bottom, and the surrounding walls or sides meet this bottom at right angles; and at this point the teacher is able to emphasize the fact that that is what is meant when we say that a cavity should be given a box-like form. They may then be asked why the cavity should be given a flat seat. Nobody knows. Two or three guess and guess wrongly. The teacher rapidly sketches the outline of a molar on the board, and shows a cavity with a concave

pulpal wall. He sketches another with a cavity having a flat pulpal wall. With colored chalk he shows a filling in each cavity, and indicates the cusp of an opposing tooth pressing against each filling near its margin, and asks the class what happens. They tell him that the first filling rolls, and that the other remains stationary. At this point the teacher uses the term "resistance form" for the first time, and talks about it for a few minutes, not so much for the purpose of teaching them something as to crystallize in their minds what they have already learned. In a similar way retention form, bevelled margins, and the other important details of a proper cavity form may be taught, and I contend that the student who has learned the how and the why of these things in the lecture room will do his work in the technic laboratory more intelligently, will do it better, and will derive more benefit from it, than the student who carves a cavity as he is told to carve it by the demonstrator, without knowing what he is doing, or why he is doing it.

In teaching operative dentistry the problem of combining oral instruction with the study of text-books in such a way as to get the best results is, to my mind, a most serious one. It may be that some teachers have solved this problem, but I cannot claim to have done so. I have tried the lecture method with collateral reading of the text-book, and I have tried the assigned lesson and recitation method, and neither has been entirely satisfactory. At the present time I am using a combination of the two methods that suits me better than either, but I realize that it is a compromise rather than a scientific method of teaching. On this phase of my subject, therefore, I shall content myself with a brief recital of my own experience and a suggestion or two based upon that experience, in the hope that they will stimulate a helpful discussion.

For some years I used the lecture method exclusively. I made my lectures as interesting as possible. I endeavored to make everything so plain that the dumbest student could not fail to understand it. The students approved of my method. They learned the theoretical part of operative dentistry almost without effort, by absorption. Of course I urged them to supplement my lectures by reading of the text-book, but few of them did so. What was the result? When those students graduated they were narrow. They knew my favorite theories and my favorite methods. They were familiar with my pet expressions, and some of them could give a very good imitation of my gestures and facial expressions; but all they knew about the subject was what

they had obtained from me, and, what was worse, they did not know how to obtain additional information. They were not familiar with their text-book. They did not know what it contained or how to use it. Occasionally I would receive letters from recent graduates asking questions, the answers to which could have been obtained from any book on the subject. I finally came to the conclusion that any system of teaching which takes into consideration only those things which must be learned in college, and does not prepare the student to continue his studies after he has graduated, is more or less of a failure. I became convinced that the student should be made familiar with the contents of at least one text-book on operative dentistry, and so I decided to change my system and adopt the recitation method. I tried it for a year, or rather part of a year. My experiment with the freshmen lasted, I think, about three weeks. It took me just about that long to find out that they could not read the text-book understandingly. In our school we use the American Text-book of Operative Dentistry. As it aims to cover the entire subject, it naturally starts out with a description of the teeth, and in the opening paragraph, in order that the student may have a clear idea of what he is going to study, the following definition of teeth is given: "The teeth are, morphologically, transformed tissues, belonging to the tegumentary system of animals, and are hard, calcareous bodies, situated in the oral cavity, at the anterior orifice of the alimentary canal." Now what does that mean to a freshman? What does he know about morphology, or transformed tissues, or the tegumentary system of animals? He is to be congratulated if his preliminary education has taught him what the alimentary canal is, and where its anterior orifice is located.

I wish that somebody would write a book—a little book—on operative dentistry for freshmen. In that book I wish that he would tell the freshman the things he ought to know about operative dentistry, in language that he could understand. I don't think such a book should be a compend, or anything of that sort. It should be a real text-book that would serve as an introduction to the subject. Such books are available for the beginner in Latin or Chemistry, and should be available for the beginner in operative dentistry.

While each freshman in our school is required to have a copy of the prescribed text, and while I assign certain pages here and there to be read, nearly all my teaching of the freshman class takes the form of lectures and demonstrations. To the juniors and seniors, however, I assign a

certain number of pages to be studied, and prepare questions based upon the text. No one knows who is to be called upon to answer any particular question, as no regular order is followed, and the question is always stated before the student's name is announced. I have before me a quiz book, and the students know that every answer is graded, and that the record is taken into consideration in the final summing up of their work. This compels them to study, which is one of the chief advantages of the recitation method. But I do not confine myself to any regular routine. One day I may ask twenty or thirty questions based upon the text, and the next day only five or six. Sometimes the students ask me more questions than I ask them. Sometimes we devote the entire hour to a discussion of one or two phases of our subject, and occasionally we get off the subject entirely. It may not be scientific teaching, and my methods could hardly be called systematic, but I cannot help feeling that in conducting these informal discussions, where the interest of the student is aroused, his imagination excited, and his reasoning powers brought into action, I am doing my best teaching. At any rate I have the consolation of knowing that, although I may not have covered the entire subject assigned for the lesson, the students have read the text and have some knowledge of it.

We all appreciate the great value of the technic laboratory in teaching operative dentistry. The introduction of the technic course revolutionized the work of our colleges. It is based upon sound teaching principles, it is adapted to the needs of our students, and it gives excellent results. As dental teachers we owe a debt of gratitude to Dr. Black, Dr. Weeks, and Dr. Cattell, who were the pioneers in developing this most important feature of dental pedagogies. I shall not enter into any discussion of what should be included in a technic course, or how the teaching should be conducted. We have a commission on that subject which makes valuable reports, and we have an exhibit, from either of which much more can be learned than could possibly be gathered from anything I might say on the subject.

While there may be much room for improvement in our didactic teaching, and while we may still have much to learn in regard to laboratory methods, I believe that the most imperative demand at the present time is for better teaching in our infirmaries. As a matter of fact, we are just beginning to realize that teaching is called for in the infirmary. We are still too apt to regard the clinic room as a place where the student puts into practice what he has been taught else-

where. We look upon it as a place where the student gains experience rather than knowledge. Of course the experience is necessary, and its importance to the student can hardly be over-estimated, but we have too largely overlooked the opportunities for effective teaching in connection with it. We do not even prepare for it. We divide our teaching staff into three classes—professors, lecturers, and demonstrators—and we all know what that classification means. The selection of a professor is a matter that calls for careful consideration as to fitness and ability, but the selection of a demonstrator is too frequently a matter of finding some recent graduate who can be induced to accept a nominal salary for his services. Many schools still seem to think that they have done their full duty to the infirmary when they have placed a competent superintendent in charge of it. But that is not enough. He must have competent assistants. How many demonstrators are selected because of their teaching ability? Yet I submit that a demonstrator who is competent and knows how to teach can do more effective work standing beside the chair of an operating student than can any professor in the lecture room. We need more demonstrators and better demonstrators, and we need them badly.

I have referred to the importance of scientific teaching in connection with class-room work, and I wish to emphasize its importance in infirmary teaching as well. In this connection we should remember that no student will take as much interest in a mental picture of a tooth, or even in a drawing or model, as he will in a tooth in the mouth of a patient. The teacher standing before his class may grow eloquent in pointing out why a faulty cavity preparation will probably be followed by recurring decay, and how such a result may be avoided, without making a very lasting impression upon the mind of a student; but if that student is asked to replace a filling that has failed in a patient's mouth, and is made to study the reasons for the failure and then correct the conditions by a proper cavity preparation and filling, the impression is likely to be lasting. But the desired effect will not be produced unless the demonstrator uses proper teaching methods. Suppose, for instance, that decay has recurred at the bucco-gingival and linguo-gingival angles of a proximo-occlusal cavity. The demonstrator might tell the student that the decay was due to the fact that the outline of the cavity had not been sufficiently extended, and direct him to remove the filling, extend the cavity buccally and lingually, and give it a flat gingival wall. If the

student carried out the instructions he would be learning something, of course, but how much more he would learn if the demonstrator were to question him regarding the movements of food at that point during mastication, the presence or absence of a contact point, the condition of the interproximal gum tissue, the relation of the gingival margin to the free margin of the gum, the width of the embrasures and the general tendency of the teeth to decay. Having had class-room instruction in regard to all these things, a little study of the case would enable the student to answer intelligently, and the bearing of these conditions upon the case involved would be impressed upon him. It would no longer be to him simply a filling that had failed, or even a filling that had failed because of improper cavity preparation. He would understand why that particular cavity required a certain kind of preparation to insure permanence of the filling, and under the guidance of the demonstrator would be able to work out the details intelligently. Our students must be taught to observe and to think, but unless we make special efforts to develop in them the faculties of observation and reason they will look at things without seeing them, and do their work mechanically. I have used cavity preparation as an illustration, but similar methods may be applied to the teaching of every department of operative dentistry, and incidentally, I may say, to every department of infirmary practice.

In teaching operative dentistry clinically the teacher has opportunities for emphasizing much of what the student has previously learned. The ideal condition which we are trying to bring about in the mouth suggests physiology, the forms of the teeth recall dental anatomy, cavity preparation is based upon histology, extension for prevention comes from a knowledge of pathology, purulent conditions are explained by bacteriology, bleaching teeth is nothing but applied chemistry, and making an inlay that will fit a cavity, we have recently learned, is simply a matter of physics.

Are we availing ourselves of the teaching opportunities thus presented? Are our demonstrators qualified to do this work? If they are qualified, have we enough of them so that they have the time to do it? If not, why not?

The Thomas W. Evans Museum and Dental Institute

THE dedication of the new building of the Thomas W. Evans Museum and Dental Institute, School of Dentistry, University of Pennsylvania, occurred on Monday and Tuesday, February 22nd and 23rd, 1915, in the city of Philadelphia.

Thomas W. Evans, the founder of the Thomas W. Evans Institute, was born in Philadelphia, December 23, 1823, and died in Paris, France, on November 14, 1897, shortly after his return to Europe after a brief visit to America. As a boy he lived with his parents in the house which stood on the lot at the northwest corner of Fortieth and Spruce Streets, where the new building now stands as a permanent monument to the great American dental surgeon. He was the youngest of three sons, Rudolph, Theodore, and Thomas, the subject of this sketch. He was educated in the common schools of Philadelphia, and at the age of fourteen entered the employ of Joseph Warner, a gold and silversmith of Philadelphia, whose business included the manufacture of certain surgical instruments, and incidentally of plate, soldiers, and some of the instruments used by dentists. His apprenticeship with Warner brought him into occasional contact with dentists of that period and their methods, and in that way he no doubt derived the impetus which led him later to enter upon the study of dentistry as a profession. In 1841 he became a student in the office of the late Dr. John DeHaven White, of Philadelphia, with whom he remained for two years. During his studies with Dr. White he attended lectures at Jefferson Medical College, from which, in due course, he was graduated.

He practised his profession for a time in Maryland, and later, in partnership with Dr. Philip Van Patten, at Lancaster, Pa., with whom he remained until 1847. It was during his stay in Lancaster that Dr. Evans performed a series of gold contour filling operations which he exhibited at the annual exhibition held under the auspices of the Franklin Institute in the fall of 1847, and for which he received a gold medal in recognition of the novelty and merit of his work. Dr. C. Starr Brewster, an American dentist practising in Paris, had his attention called to this work done by Dr. Evans, and was so impressed by it that a partnership was arranged between them.

This partnership between Drs. Brewster and Evans lasted until 1850, during which year Dr. Evans opened an office on his own account in the Rue de la Paix, and entered upon a professional career which was as wonderful as it was unique.

Although Dr. Evans was not the pioneer American dentist in Europe, he brought to Europe a combination of personal characteristics and special technical ability which not only made him a conspicuous figure, but gave an impetus to dental practice and a status to its representatives before unknown.

Dr. Evans as an operator may have had many peers, and in recent times many who excelled him as a practitioner. There are not wanting those who place but light estimate upon his abilities as a dentist, and who attribute his phenomenal success to abilities quite apart from his skill as an operator. There is, however, evidence tending to show that he was an operator of more than usual ability.

His professional equipment in itself cannot be regarded as the cause of his phenomenal success. His abilities as a practitioner were merely a contributing factor in a complexus of characteristics which have helped to make Dr. Evans the most conspicuous figure connected with dentistry. Dentistry became to him the stepping-stone which served as a means of bringing him into contact with those to whom he made himself of value and who contributed substantially to his success. He was a born diplomat, possessing a keen perceptive faculty which enabled him to read and correctly understand human nature, delicacy and firmness in his treatment of affairs, a rigid honesty of purpose, and a foresight which was intuitive. In short, he knew how to make the best of his opportunities, and in some degree create them. His association with Dr. Brewster brought him into contact with the aristocratic element of French society; it was his avowed ambition to secure for his clientele all of the crowned heads of Europe, and it has been asserted that in this he succeeded. By his skill and attractive personality he drew them to him and won their confidence. His confidential relationship with Napoleon III. has become historical, and its two most important results—namely, the diplomatic mission intrusted to him by Napoleon to President Lincoln during the war of the rebellion, which resulted in the neutrality of France with respect to that issue, and the aid rendered by him to the Empress Eugenie in her escape to England during the riots following the fall of Sedan at the

close of the Franco-Prussian war—are matters of common knowledge.

It has been stated that Dr. Evans owed his fortune to the patronage shown him by Napoleon III. This is not wholly true. It is a fact that the doctor's reputation was greatly enhanced by the confidence of the French Emperor, and that his list of patrons was greatly enlarged as a result. but by far the greater portion of his accumulated wealth was due to the real estate investments made possible through the personal friendship of the Emperor.

Much of Dr. Evans' life was devoted to works of charity and philanthropy. He rendered important service during the Crimean and Franco-Prussian wars in the care of wounded soldiers, and in introducing more sanitary and humane methods in military hospitals. Sent by the Emperor at his own suggestion during the Crimean war, to study the sanitary condition of European camps and hospitals, he was so impressed by the pictures of misery and suffering there presented to him that on his return he secured the interest of the civilized world in important measures of reform. His record during the late Civil War in the United States will be found in the history of the United States Sanitary Commission, which he organized in Philadelphia, coming over especially to serve his native land in the hour of need. During the Franco-Prussian war he was probably the only man in Europe who might pass from camp to camp. During all this memorable campaign he personally directed the movements of the ambulance corps of the Red Cross Society.

It was the elements of character which led him to undertake such work and the associations which it made for him that more than all else contributed to his reputation and material success. Throughout his whole career he never forgot, and indeed constantly emphasized, two facts: that he was an American; and that he was a dentist. In his loyalty to his profession he was steadfast; his faith in its possibilities was unfaltering; he was always the champion of high professional ideals. The principles which animated his professional life he manifested from the beginning of his work, and were in marked contrast with those of many of his early confreres. In a communication written soon after he located in Paris he said: "I may have but little to impart, yet that little is at the service of each and all members of my profession; and gladly would I hail the day that should make all that is sound in science and valuable in art

common property. . . . By the discussion of subjects connected with our profession and by the contribution of each according to his ability, by the comparison of the different modes of practice and the making known all new discoveries and improvements, we shall place the profession on more commanding ground, and better serve the generation in which we live."

That his professional life was lived in harmony with these principles the results show. The measure of success which he attained was not limited to material acquisitions, but was extended to the elevating influence which he exerted upon the general status of his profession. He lived to see his chosen calling placed upon more commanding ground, and the value of its ministrations to his generation substantially recognized.

That his life-work was a large contributing factor to that end cannot be doubted, and when all of the factors which have helped in the advancement of the professional status of dentistry are fairly estimated, the influence of the life of Thomas W. Evans will be among the greatest.

Oral Hygiene Workers Object to United States War Tax

INCENSED by the war tax recently levied on all dentifrices and agents used to keep the mouth clean, a committee having for its members many of the most distinguished physicians, dentists, health officers, and scientists in the country, has been formed for the purpose of petitioning Congress for the immediate amendment of the law and the removal of the stamp tax on all substances used in maintaining oral cleanliness.

While the oral hygiene movement is comparatively young, in the past five years the campaign has become nation-wide and its educational propaganda has been carried into every section of the country until to-day there is hardly a public school that hasn't its tooth-brush drill. A great sum of money has been spent by members of the medical and dental profession and public-spirited persons who appreciate the importance of oral cleanliness as a means of preventing disease.

The oral hygienists claim that the tax is greatly retarding their work and that classing substances for the dental toilet

with hair dye and cosmetics has a bad moral effect. It is a significant fact, which the committee of scientists will point out to Congress, that not one of the nations at war in Europe, though they have taxed almost every conceivable thing, has ventured to levy a war tax on cleaning. The German army, and probably the rule is as strict in the armies of the allies, a soldier is fined if caught without his tooth-brush.

At a meeting, Dr. Herbert L. Wheeler, of New York, was made chairman of the committee. In accepting, Dr. Wheeler, who has been a leading spirit in the oral hygiene movement, is reported to have said:—

“A tax on substances used in the maintenance of mouth cleanliness is detrimental to public health, since it fosters filth and is conducive to the development and spread of disease.

A tax on substances used in the toilet of the mouth is in conflict with the educational work now being done by members of the dental and medical professions.

“The ultimate effect of the present tax on oral prophylactics will be an increase in the number of diseases of bacterial origin.

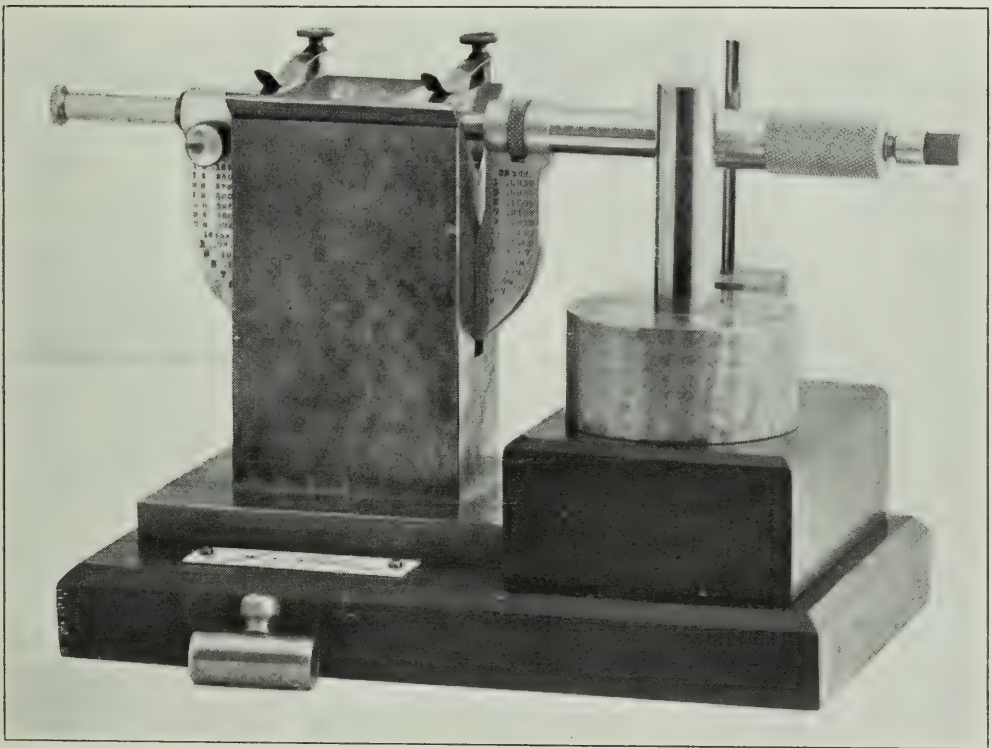
“Does the United States Government wish to advertise to the world that its supposed leaders, its lawmakers, are so grossly ignorant that they are unable to discriminate between a necessary toilet article and a luxury while cities are studying to find some way to enforce mouth cleanliness on the school children?”

The provision of this bill, “Taxing tooth and mouth cleansing substances” makes it appear so.

New Piece of Apparatus, Department of Prosthetics, R. C. D. S.

THE cut represents a new piece of apparatus recently added to the Department of Prosthetics of the Royal College Dental Surgeons. It consists of a standard in engine-turned finished brass in which is firmly fixed a Browne & Sharpe two-inch micrometer reading in thousandths of an inch, and by a vernier to ten thousands of an inch. This is so placed in the standard that the measuring surface of this micrometer is in the central position in a 90° groove (right angle), and presses against two sliding blocks between which the remaining distance is exactly one inch. These sliding blocks are lightly held by two steel finger

springs. This arrangement permits a mix of plaster or other similar material being placed in the groove of 90° and the expansion or contraction may be read off on the micrometer graduation. Previous to a series of readings a standard inch rod (seen in front of instrument) may be dropped in and the micrometer accurately adjusted for the temperature of the room. Mounted with these on a mahogany base are two Gilmore needles, the smaller for testing the initial set measuring $1/12$ of an inch at its point and weighing in all 4 avoirdupois ounces. The larger, for ascertaining the hard set, being one avoirdupois pound and $1/24$ of an inch at its point. The parts are fitted with extreme accuracy and reflect credit upon the W. H. Sumbling Machinery Co. of Toronto, by whom the work was executed.



This instrument has created a great deal of interest among the students at the College and has been used by them in a series of plaster expansion and set tests, and some very interesting and practical results have been noted and are further expected.

The appliance was constructed under the instructions and personal supervision of Dr. W. E. Cummer, Professor of Prosthetic Dentistry, R. C. D. S.

Tributes to the Late Dr. W. H. Doherty

THE Faculty Council of the Royal College of Dental Surgeons, at a meeting held on Tuesday, February 23rd, 1915, upon motion of Drs. W. E. Willmott and G. G. Hume, adopted the following resolution:

“That we, the members of the Faculty Council of the School of Dentistry of the Royal College of Dental Surgeons of Ontario, at this, our first meeting since the lamented death, on February 17th, 1915, at the early age of 32 years, of our esteemed colleague, W. H. Doherty, D.D.S., L.D.S., Professor of Dental Anatomy and Comparative Dental Anatomy, give expression to our deep sympathy with Mrs. Doherty and the little children in their sudden and great bereavement by the loss of a loving husband and father.

“That we place on record our high appreciation of the late Dr. Doherty as a professor whose natural aptitude for teaching was diligently cultivated until he had reached a very high standard of excellence as an educator, and whose removal leaves a vacancy in the College which will be difficult to fill:

“As a Christian gentleman whose example may be safely emulated by every student;

“As a good citizen interested in everything which tended to the moral and material well-being of our city, and especially interested in the physical well-being of the children of our Public Schools, for which he was for three years chief Dental Inspector;

“As a friend beloved, whose admirable qualities of mind and heart, purity of life, and unfailing courtesy of manner have endeared him alike to staff and students.”

THE following tribute was made by W. E. Struthers, B.A., M.D., Chief Medical Officer, The Workmen's Compensation Board, Ontario, and formerly Chief Medical Inspector of Schools, Toronto:

“Some men die when their sun is low in the heavens, and some die when their sun is at its zenith, but our friend died while his sun was still rising.’ So said he who performed the last sad rites over the remains of the late Dr. W. H. Doherty. The sudden death of a bright and capable young man just as he enters the threshold of a busy and useful life is always a catastrophe, and the death of Dr. Doherty with its startling suddenness was a great shock to his many friends and admirers.

“A brilliant career in his profession and a life of great usefulness to this city was just opening before him. He was filled with the quiet enthusiasm of the missionary, and had a vision of a great field of congenial and soul-satisfying work among the school children. He appealed to all those who were fortunate enough to meet him in his daily work by his eager earnestness, sound judgment, thoroughness, and deep sense of public duty. He proved himself a man of superior calibre, splendid probity, and the highest ideals. He showed great capacity and breadth of view, but withal a soul too keenly sensitive to the careless criticism of public servants.

“The preliminary investigations into the conditions of children’s teeth in Church and Elizabeth Street Schools in 1910 aroused in him a strong desire to help in the great and humane work of saving children from the pain and misery of ignorant and disastrous neglect, to save children from ill-health, disease, and death. In season and out of season he preached the gospel of oral cleanliness and care.

“Although it was a financial loss to him, he undertook the leadership in the dental work under the Board of Education in connection with the establishment of a system of medical and dental inspection. At first, like many others, he did not think it was possible to carry on dental clinics in the schools, but soon after the establishment of the municipal dental clinics here he recognized from his experience that far better results could be obtained for the school children by the establishment of these clinics in the schools.

“After patient study and consideration, Dr. Doherty worked out for use in the schools a set of thirty-two oral hygiene cards, 26 x 30 inches. These were intended to teach the important lessons of oral hygiene in a graphic and easy way. Many other cities in Canada and the United States have obtained these cards for use in their schools.

“It is believed the establishment of dental clinics within the schools had its origin in this city. Dr. Doherty organized the first school dental clinics in Annette and Borden Schools in June, 1913. Two more were organized in September, nine additional in 1914, while another was in process of organization at the end of the year.

“Dr. Doherty was also deeply interested in all phases of child welfare work, and was always generously willing to assist with his strength, his time and his well-informed, well-balanced mind.

“Toronto has lost the services of a highly capable public servant, and the school children a genuine friend not easily

replaced. He gave of his services freely from a high sense of public duty and a very real love for childhood. The deepest sympathy of his friends goes out to his bereaved wife and children."

DR. J. A. BOTHWELL, Superintendent of Dental Clinics, Department of Public Health, Toronto, has contributed the following words of appreciation to the memory of his co-worker and friend:

"The late Dr. Doherty was born in Chatham, Ontario, in 1882. Here he attended the Public School, and later the High School and Collegiate, where he graduated with honors, obtaining a first-class teachers' certificate. After attending the Model School, he taught a school near Chatham for two years.

"In the fall of 1902 he entered the R. C. D. S. as a freshman, the last freshman class of the three-year course in dentistry. In 1903-04 'Billy,' as we called him, was President of his year. He took a very active interest in all College affairs.

"In 1904-05 he was out of College and spent a year and a half in Brantford under indentures in the office of Dr. Button. While in Brantford he took an active interest in the Debating and Literary Society. He was also a popular member of Brant Street Methodist Church choir.

"In the fall of 1905 he entered his senior year at College and became a member of the Hya Yaka staff. He was also a member of Varsity Glee Club and went with them on a tour during the Xmas vacation of that year. He graduated in the spring of 1906, obtaining his L.D.S. and D.D.S. degrees.

"During his College course 'Billy' was always genial, popular, and anxious to do his part in raising the ideals of the students and the profession. He was much interested in his work and ranked among the first men of his class.

"Shortly after graduation he purchased a practice at No. 9 College St., Toronto, where he remained for two years, and then moved across to 26 College St. While here he became interested in College work as a demonstrator and teacher. His success as a teacher soon brought promotion, and he was made Professor of Dental Anatomy and Comparative Dental Anatomy. He greatly developed the teaching of dental anatomy. He made the course most interesting and instructive to the students and aroused the admiration of the dental teachers throughout Canada and the United States. He was a faithful attendant at the Institute

of Dental Teachers, and was always anxious to take home something to benefit his students. Their work and welfare were always in his mind, and he had many talks with the writer as to how best he might help some backward student.

"In spite of his onerous practice and college work, he was asked at the time of the introduction of dental inspection in the Public Schools of Toronto to take charge of the superintending and management of that work. He took up this work with a full realization of the sacrifice it meant, but he was anxious to serve his profession and the community. He spent many extra hours planning and perfecting the organization that is now almost complete, and of which the dental profession ought to be proud.

"In July, 1908, Dr. Doherty was married at Brantford to Miss Mabel Irene Wolfe of that city. Two children, John, aged five, and Elinor, aged 14 months, and his wife all survive him. He enjoyed nothing as much as to be at home with his family, and spent much of his spare time with them in his garden, where he had many fine flowers. He was greatly interested in gardening and horticulture.

"For the past few months he has successfully conducted a Bible class for men, which has grown steadily under his leadership. No matter what he undertook he always made a success of it.

"Dr. Doherty was well known in the profession both in Canada and the United States. He will be greatly missed by the very many personal friends in Toronto, and particularly so by those associated with him in oral hygiene work and on the faculty of the Royal College of Dental Surgeons. He was much loved and honored by all who knew him."

Northern Ohio Dental Association

THE annual convention of the Northern Ohio Dental Association will be held in Cleveland, June 3rd, 4th and 5th, 1915.

C. D. PECK, *Secretary.*

WESTON A. PRICE, *President.*

CORRESPONDENCE

Letter From Captain Corrigan

MEMBERS of the dental profession will be glad to read the following extract from a letter from Dr. C. A. Corrigan, who left Toronto last autumn with the First Canadian Contingent, and who has now arrived at the front. Dr. Corrigan is connected with the Army Service Corps in the capacity of captain.

“A week ago this morning, at 4 o’clock, in the dark and rain, we hitched up and left our camp across the Channel. This morning, at almost the identical hour, we arrived at our billet in France. Took a very roundabout route, as you may infer from the fact that we were seven days en route. Had pretty rough trip, with very poor accommodation, particularly for the men. The crew were composed of small, very black men, natives of India. I was not very sick, but felt uncomfortable enough to spend one day in bed. Landed at quite a large seaport, the life and people of which were very interesting to us. Old women in black gowns with little white caps (like a maid’s) and children and many adults wearing wooden clogs. After a night under canvas there—pouring rain—no blankets, sixteen men in a bell tent, we entrained at 6 p.m. next day, and spent two days and two nights on the train, reaching a station near here at 1 a.m. As facilities for unloading were poor, it was nearly three before we began our trek—only about three miles to the farm where we are billeted. As we came along the road we could distinctly hear the boom of the big guns and see the reflection from the searchlights. We are only about ten miles from the firing line. The Germans occupied this territory in October, but were later driven back. At a village a quarter of a mile from here they shot the priest and twelve young men, after first making them dig their own graves. We officers have a couple of rooms in a farmhouse of an old widow with several middle-aged daughters. They are very kind to us. The men sleep in the hayloft, and so have a more comfortable bed than for some time. Coming up they were in box cars with a little straw to lie on. Our horses unfortunately are still in the open. It has been bright and

fine to-day, but we expect another long siege of wet weather, as March is the wet month here. Already the ground is saturated and ditches full. Last evening we passed a hospital train taking about five hundred injured to the base, and this morning I saw another going down. As our mail is all censored, we can give no information as to our locality, etc. I am feeling fit and fine. Can't understand how rumors got started in Toronto that I was otherwise. The country around here seems all so peaceful, it is hard to believe such terrible work is going on so near.

"I'll have to close, as my horse is saddled for me to go to headquarters. You must not expect to hear from me very often, and therefore a letter must be considered as for all. The boys are having great fun trying to learn French. I have an interpreter attached to the company."

Oral Hygiene Reports

Newark, N.J.—Dr. Henry Fowler, President of the Central Dental Association and Chairman of the Mouth Hygiene Committee has recently issued his annual report, in which he draws attention to the co-operation of the Boards of Education of the city to bring about better dental conditions among the school children. Dr. Fowler published a list of some thirty-five schools and eight hospitals which have arranged to have lectures given on the subject of oral hygiene.

Detroit, Mich.—The monthly report of the dental clinic of the Board of Health, an organization in charge of the work for the children of the public, parochial and sectarian schools of Detroit, shows that 18,000 examinations have been made by eight inspectors during November. The total since the opening of the school year is 36,000, while fully that number of children remain for examination during the second part of the school year.

Fully 95 per cent. of all children examined are in need of work on their teeth. Oral hygiene is recognized as a necessity among the school children, and the Board of Education is now giving the pupils marks for condition of their teeth. The letter U appended to a report means unsatisfactory, while S means the teeth are satisfactory.

Dr. Charles H. Oakman, president of the Board of Health and in direct charge of the detail clinic, said the work has taken great strides and Detroit is recognized as one of the leaders in oral work among the school children.

MULTUM IN PARVO

This Department is Edited by C. A. KENNEDY, D. D. S., 2 College St., Toronto

Librarian, Royal College of Dental Surgeons of Ontario

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS
OF THE PROFESSION, WILL BE GREATLY APPRECIATED BY THIS DEPARTMENT

ALUMINUM PAINT AS AN ADJUNCT IN THE DENTAL LABORATORY.—Aluminum paint is a most useful adjunct, since with it an old vulcanizer, gas ring, or kerosene heater may be made to look like new. It is easily and quickly applied, and will stand heat well.—*G. H. Fetherston, Australian Journ. of Dentistry (Dental Cosmos)*.

TO STERILIZE INSTRUMENTS.—Use an oblong agate affair bought at hardware store, just right size to hold forceps, etc. Fill with water, using about a teaspoonful or more of common washing soda, costing about one or two cents per lb. Remove forceps after boiling, and when right to handle polish with towel. Will look like new and there will be no rusting.—*C. P. S. (Dental Review)*.

CLEANING THE CERVICES OF TEETH BEFORE APPLYING THE RUBBER DAM.—The rubber dam should never be applied to a tooth before its cervix has been cleaned and disinfected. If this precaution is omitted, infectious material is forced by the rubber and the ligatures under the gum margin, where it may remain for hours. The interruption in the circulation of the blood favors infection of the weakened tissue. For disinfection, hydrogen dioxid, followed by thymol-alcohol, is recommended.—*H. Pichler, Oesterreichische Zeitschrift fur Stomatologie (Dental Cosmos)*.

EMERGENCY CLEANING OF INSTRUMENTS.—“Typist” writes to *The Lancet* as follows: “Many years ago I found that the special india-rubber made for the use of typists, which, I believe, is a mixture of rubber and emery, was also good for cleaning rust spots off scissors, knives, and so forth, and also certain metal parts of the typewriter itself, and I have many times recommended its use, especially in emergency. Now and again I see it recommended in popu-

lar journals. The emery, or whatever it is, is in such a fine state of division that while it cleans well it does not scratch the instrument. I had occasion once to recommend it to a surgeon who was going to perform some minor operation, and he was well pleased with it and said that it was a new notion to him.”—*British Dental Journal*.

A WAY TO KEEP OIL OF CAJEPUT.—Many practitioners use oil of cajeput or some other oil for smoothing off the wax model for an inlay before removing from the cavity. To prevent using an excess and spilling the contents of the bottle, take an ordinary medicine bottle, fill with absorbent cotton. Pour oil on this cotton until slightly saturated. When the pellet of cotton, held in the cotton carrier, is immersed into the oily cotton of the bottle it will not become over-saturated.—*F. S. Dilger, D.D.S., Chicago, Ill (Dental Review)*.

THE TEETH AND LIFE INSURANCE.—That dental and oral conditions have an influence on the health of individuals is being recognized by life insurance companies. In 1914 one of the largest companies, the Metropolitan, issued a pamphlet, “Teeth, Tonsils and Adenoids,” in which is stated that it is “Printed and distributed by the Metropolitan Life Insurance Company for the use of its policy-holders.” The issuing of a pamphlet of this character is commendable and shows a progressive spirit on the part of this insurance company. While some portions of the text would have been more exact had they been written by a dentist, it is an acceptable publication as it is, and will undoubtedly prove of value as an educational medium along these lines. People are awakening to the fact that diseased conditions of the teeth and mouth are more detrimental to health than they formerly supposed, and one of these days general dental and oral conditions will be taken into account when examining applicants for life insurance.—*Dental Summary (Dental Cosmos)*.

EFFECT OF DRINKING-WATER UPON THE PREVALENCE OF CARIES IN SCHOOL CHILDREN.—The harder the drinking-water, the better the teeth and the lesser the infant mortality; again, the lesser the infant mortality, the better the teeth. Districts with soft water are preferred by industrial concerns; the poor hygienic conditions prevalent in manufacturing districts enhance the detrimental effect of the soft water.—*Cook, Lancet (Dental Cosmos)*.

ORAL HEALTH

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A Monthly Journal devoted to the furtherance of individual and community health by the advancement of Dental Science and Oral Hygiene.

Published in the hope that it may reach those with an open mind, a willing heart and a ready hand to serve.

SUBSCRIPTION PRICE - \$1.00 PER YEAR.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, 229 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to the Publishers, Oral Health, 229 College St., Toronto, Canada.

Vol. 5

TORONTO, MARCH, 1915

No. 3

EDITORIAL

Heating and Ventilation of the Dental Office

A DENTAL office should contain one or more thermometers, that the office air may be kept at an even temperature. Not only should a proper temperature be maintained, but an abundance of fresh air supplied. Most dental offices are either kept too hot or the air is allowed to become impure through lack of sufficient ventilation.

Dentists spend about one-third of their time in the office and yet give scant consideration to these questions. The careful heating and ventilation of the office has a direct bearing upon the health and efficiency of the operator, and the proper regulation of these conditions is one of the most important duties a dentist's assistant may perform.

More service and better service will be rendered by operators who work in fresh air maintained at a correct temperature. Make your work more efficient and prolong your life by giving proper attention to the office air.

The Oral Hygiene Movement and Public Health

THE Canadian Commission of Conservation has established a bimonthly bulletin devoted to the conservation of life. It is generally recognized to-day that a country's true greatness lies in the wealth of its manhood and womanhood rather than in the richness of its natural resources.

As evidencing the growing recognition of the importance of conservation as applied to the citizen, and particularly to problems of public health, the October bulletin says:

"It is perhaps no exaggeration to say that in no other period of history has the prevention of disease occupied so large a place in the thoughts of every intelligent community as obtains at this present day. Organizations of intelligent men and women exist in all of the large centres of population whose sole aim and purpose is the conservation of the public health. Their time and means are freely given to the end that their fellows, of every class and condition, may not only be nursed back to health when they fall ill,* but that their well-being may also be preserved by a healthful environment, and pure and wholesome food, in order to limit disease they may contract, avoid unnecessary ailments, and prolong their lives to their families and society."

Oral hygiene is destined to play a large part in every scheme of prevention and for the maintenance of individual and public health. Oral disease and uncleanness is a public health problem and should be treated as such by both the dentist and the local officer of health. Dental clinics are sometimes temporarily maintained through the self sacrifice or philanthropy of individual dentists, but those interested should ever have in view the ultimate shifting of responsibility to the public health authorities.

In Toronto fourteen dentists are employed by the Board of Education for half time service in the public schools, and eight dentists are employed by the civic authorities to man the free municipal clinics. Every dollar of public funds spent on good dentistry is a real economy and will prove a large factor in the prevention of disease and the upbuilding of a strong and healthy race.

Dr. Marcus Ward's Paper

AT the request of Dr. Marcus L. Ward, Ann Arbor, his paper, "Factors of Importance in the Construction of Cast Gold Inlays," read before the Toronto Dental Society Monday, February 15, 1915, is to be published concurrently in *Dental Cosmos* and ORAL HEALTH. Arrangements have now been made that Dr. Ward's paper will appear in the May issue of ORAL HEALTH and *Dental Cosmos*.

The Manitoba Dental Association

THE following dentists were successful in passing the recent examination of the Manitoba Dental Association: H. C. Jeffrey, F. Harwood, W. J. Bell, F. E. Warniner, B. S. O'Grady, J. P. Kirwin, E. J. Kelly.

Eastern Ontario Dental Association

THE Annual Convention of the Eastern Ontario Dental Association is to be held on June 16th, 17th and 18th, 1915, in the city of Ottawa. The Executive Committee are planning to make the Convention this year the best in the history of the E. O. D. A. Committees have been appointed as follows:

Programme Committee—Drs. Leggo and McCartney.

Entertainment Committee—Drs. R. M. Armstrong, Chas. Jewel, O. K. Gibson.

The Secretary of the Society, Dr. O. K. Gibson, 103 Bank St., Ottawa, will be glad to answer all inquiries regarding the Convention.

ATTENTION is drawn to an announcement in this issue of a vacancy upon the staff of the Royal College of Dental Surgeons in the Department of Dental Anatomy and Comparative Dental Anatomy. Applications will be received by Dr. J. B. Willmott, 96 College St., up to the 1st of May, 1915.

THANK God every morning when you get up that you have something to do that day which must be done, whether you like it or not. Being forced to work and forced to do your best will breed in you temperance and self-control, diligence, and strength of will, cheerfulness and content, and a hundred virtues which the idle never know.—Charles Kingsley.



R. A. FALCONER, C. M. G.. M. A.. LL. D.

President, University of Toronto.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 5.

TORONTO, APRIL, 1915

No. 4

*A Review of Recent Studies Upon Amoebic Pyorrhoea**

BY ALLEN J. SMITH, M.D., AND M. T. BARRETT, D.D.S.,
OF PHILADELPHIA.

(From the Pathological Laboratories of the School of
Medicine of the University of Philadelphia.)

IT may be recalled that at the last meeting of the Pennsylvania Dental Society, held in Philadelphia in the latter part of June and first day of July, 1914, the writer presented a preliminary report of the results of study in course of prosecution by Dr. Allen J. Smith and himself in the Laboratory of Pathology, University of Pennsylvania (*Dental Cosmos*, August, 1914), in which the statement was made that there is reason to hold certain parasitic amoebae, long known to occur in the human mouth but commonly disregarded and believed to be of no pathological importance, as of important pathogenic relation to Rigg's disease. This conclusion was based upon the recognition of these protozoa in the pus of pyorrhoea pockets with almost constant uniformity, their absence from the mouths of a small number of individuals without pyorrhoea lesions, and the uniform results obtained in a series of cases from the local application of emetin hydrochloride (a well-known and proven amoebicidal drug) in stopping the suppuration and relieving the other symptoms of the pyorrhoea and in causing the coincident disappearance of the parasitic amoebae. In August of the same year Bass and Johns, of New Orleans

*Read before the Toronto Dental Society, Monday, 8th March, 1915.

(*New Orleans Med. and Surg. Jour.*, Nov., 1914), came to the same results, and in their announcement were even more insistent upon the specific pathogenic influence of these endamoebae; their method of study differing from ours only in the mode of application of the emetin, which they administered hypodermically as it is given in the treatment of amoebic dysentery and its complications. These papers have excited no little interest in the part of both dental and medical practitioners, and have been followed by further publications by Bass and Johns and by ourselves as well as others. (Bass and Johns, *Jour. Amer. Med. Assoc.*, Feb. 13, 1915—vol. 64, p. 553; Smith, *Dental Cosmos*, Sept., 1914; Barrett, *ibid.*, Dec., 1914; Smith, Middleton and Barrett, *Jour. Amer. Med. Assoc.*, Nov. 14, 1914—vol. 63, p. 1746; Evans and Middleton, *ibid.*, Jan. 30, 1915—vol. 64, p. 422; Chaplain, *Dental Cosmos*, Feb., 1915.)

Our own studies in further prosecution of the general subject have been devoted partly to a search for other locations of habitat of these organisms and the evidence of their influence in determining locally in such situations inflammatory changes comparable to the periodontal suppurations originally held to be produced by them; to recognition of indications of systemic complications due to the absorption of toxic substances from such local lesions; to a biological study of the parasites and comparison of the various published reports of their discovery by different authors in and about the mouth; to efforts to cultivate them artificially in order that their causative power might be more certainly and in isolated fashion observed; and recently studies as yet unfinished have been undertaken to establish more clearly the anatomical changes which are to be found in the gums, the alveolar process and periodontal tissues, in the development and persistence of the suppurative pockets. Continually through the intervening period observations have been directed, to determine the best mode of employment of the remedy in the treatment of pyorrhoea, and to develop some method or measure by which a reasonable prophylaxis against reinfestation, and consequent recurrence of the disease, might be secured.

It should be acknowledged here that no proof exists to-day that these oral endamoebae are the sole specific cause of the large group of pyorrhoea lesion in which they are to be found. They exist in these lesions in association with a large number of bacterial species, leptothrix threads and several species of spirochaetes, and it is impossible to say that none of these associates are not also culpable with the

protozoan parasites. The proof of some (and probably an important) part of causal influence attaching to the endamoebae rests thus far upon: (a) the constancy of their occurrence in pyorrhoea pockets; (b) their absence from the mouths of control subjects; (c) and the disappearance of both suppuration and of amoebae upon the proper employment of emetin. Of course the associated organisms also disappear from the pockets with the cessation of suppuration, but not as completely as do the amoebae; and while the amoebic parasites, as far as protracted search upon our part has shown, disappear completely from the mouth, many at least of the associated organisms persist in the food and salivary mixtures to be found in the gingival grooves and in other protected positions. Emetin is proved, both in vitro and in the treatment of other amoebic affections, as dysentery, to be lethal to amoebae even when in high dilution; its influence upon bacteria is largely unstudied, but for the few species for which it has been tested it shows but low bactericidal power even in strong solution. It is therefore a natural and reasonable inference to hold, until proof to the contrary is presented, that these protozoan parasites, if not solely responsible, are at least largely responsible for the production of the lesions in question. The writers incline to the belief that they really act in symbiotic relation with some or all of the vegetable organisms with which they are in association in nature; that by their proteolytic power they prepare a highly fitting pabulum for the growth of bacteria in the form of end products of their digestion of leucocytes, red blood cells and perhaps fixed cells as well, and thus favor a rank mycotic growth about them; that by their ingestion and destruction of these bacteria they set free a not inconsiderable amount of bacterial toxins of different kinds and of varying influences; and that these toxins are locally necrosing and of essential importance in determining and maintaining the gingival and alveolar inflammation, and too may be diffused and be productive of a widespread series of complications in the body of the host, commonly discussed in connection with the "oral sepsis" of Hunter.

It cannot be too strongly urged that the objections are without force which hold these parasites innocuous because they are often found upon the exposed surface of the teeth or upon the surface of the intact mucous lining of the general oral cavity, or because they may be found thus in mouths which are at least superficially free from pyorrhoea. Few mouths of those who consult dentists for any cause

are entirely free from periodontal suppurative lesions. The real habitat of the parasites is in the cavity of the pyorrhoea pocket; and from this as the source there is no reason whatever why any number may not emerge to the mouth either actively or passively with the purulent discharge. The important habitat of dysenteric amoebae is in the tissue of the base of the dysenteric ulcers; but there are constantly thousands free upon the surface of the colonic mucous membrane and in the mucus that overlies it. The latter are the ones we meet in our fecal examinations, and by their presence in the dejecta we diagnose the existence of the amoebic type of dysentery. So we would hold that the finding of amoebae upon the oral surfaces is to be interpreted not as indicating that they are harmless, but that somewhere in such a mouth there exists a focus of infestation, as a pyorrhoea pocket, perhaps merely gingival, perhaps truly alveolar. The analogy with amoebic dysentery we feel can be more strictly drawn, in that the chronic amoebic ulcer with its destruction of tissue and its sclerotic thickening of the colonic wall, and the chronic pyorrhoea lesion, with its inflammatory absorption of the periodontal fibrillar membrane and the bone of the alveolar process and their replacement by a shrinking and retracting scar tissue, are in essence, with due appreciation of the difference of the structures involved, the same. In both the amoebae are accompanied by a variety of vegetable organisms, and the relative importance of bacteria and protozoa in both lesions is a matter of continued discussion. It is true a more active necrotic ulcerous loss of the superficial tissue of the colonic lining and a more distinct penetration of the amoebae into the submucosal lymph clefts characterizes the dysenteric ulcer; while the lining of the pyorrhoea pocket is more completely covered by epithelium and the amoebae are rarely found actually in the tissues; but aside from this the essential anatomical features are closely analogous. While the soft tissues of the wall of the pyorrhoea pocket rarely show the penetration of amoebae, it cannot be doubted that they do actually penetrate, and that deeply at times—otherwise it is difficult to explain the relation of pyorrhoea lesions with acute amoebic osteomyelitis of the jaw. In two instances the writers have encountered these parasites in deep situation, once on the embedded surface of a bit of exfoliated bone of the lower jaw, once in an osteomyelitic abscess associated with marked pyorrhoea. The accounts of Kartulis, of Flexner, of Verduin and Bruyant all bespeak the same fact; and, while for the most part the amoebae are to

be found apparently solely within the cavity of the pyorrhoea pocket, they do actually in small or in greater number from time to time penetrate into and beyond the wall, into the soft tissue, and, too, into the bone. The constant feature, however, is the occupation of the subepithelial tissue of the gum and the peridental membrane with an inflammatory cellular infiltration, leading on the one hand to the gradual removal of this tissue and more or less of the alveolar process, and replacement by scar tissue. The perpendicular shrinkage of this latter tissue is directly connected with the exposure of the roots and its lateral shrinkage with the widening of the sockets and the loosening of the teeth. Other factors co-operate, but these steps are fundamental.

In any long-standing pyorrhoea lesion, aside from the grossly visible retraction of the gums and exposure of the root and, in marked cases, the widening of the socket with loosening and perhaps rotation of the tooth, with the familiar mixed contents of the pockets, sections of the lesion examined at comparatively low magnification show the wall of the pocket lined by an extension of the squamous epithelium well down below the normal level of its attachment at the base of the dental trough (as originally pointed out by Noyes). This lining is commonly sufficiently developed to be found practically down to the bottom of the pocket; and while ordinarily a distinct interval exists in the sections between its lowest border and the cementum, in some areas the relation is close enough to justify a suspicion that an attempt at attachment has been made to more thoroughly protect the peridental tissues at lower levels from the pathogenic agents in the contents of the pockets. In any such intervals granulation tissue, infiltrated with numerous leucocytes, is exposed; and at such points the writers believe especial opportunity for absorption exists, not to exclude, however, the possibility of toxic absorption to some degree through the epithelial surface elsewhere provided. Extending to variable depths along the root and diffused beneath the epithelial lining the tissue is rich in fibroblasts and infiltrated, usually in scattered focal manner, with embryonic connective tissue cells, plasma cells, lymphocytes and polynuclear leucocytes. These foci are usually especially marked between the persisting bundles of fibrils of the peridental membrane, and along the bone or even in the bone spaces. The older the lesion the more the organization of these cellular elements is apparent, usually best seen near the upper or mouth area of the pocket wall, but in some

degree even down to the more richly cellularized tissue at the base of the pockets.

Practically invariably on the tooth, reaching from the crown down along the fang well into the depth of the pocket a layer of tartar covers the surface of the tooth and its cementum. One of the views as to the origin of pyorrhoea would attribute to this an active role in separating the peridental tissue from the cementum; although its formation is, in the opinion of the writers, more probably a secondary process, a calcification of the soft detritus collecting along the tooth as the pyorrhoea cavity advances. Doubtless it may mechanically materially interfere with attempts toward healing and attachment of new tissue to the cementum; but beyond this it is questionable whether it possesses any very fundamental importance in connection with the lesion. Unless it has been removed by instrumentation the cementum remains upon the fang, only partially or not at all absorbed, and vital, if its sensitiveness may be regarded as evidence of vitality. While essentially developing from the peridental membrane, this structure is anatomically in close dependence upon the dentine, nerve fibrillae of which have been traced by Dependorf (*Deutsch. Monatsschr. f. Zahnheilkunde*, Nov., 1913—vol. 31, p. 853) into it. Its cementoblasts, it is true, are destroyed with the advance of the suppurative lesion along the root and its regeneration doubtless is impossible, but its persistence upon the dentine of the root, unless mechanically removed, is the rule. If there be an acceptable method of overcoming the suppuration other than by instrumentation, there does not appear to the writers sufficient reason for removal of the cementum; since it must be that only from the chance of its harboring dangerous micro-organisms is it desirable to scale it away, and were it left intact it doubtless would afford a readier basis for attachment of any tissues which may regenerate about it than can the denuded and polished dentine.

In an as yet unpublished critical review of the various publications announcing the discovery of amoebic parasites in the human mouth and adjacent tissues, presented by the writers at the last meeting of the American Association of Bacteriologists, comparison is made of the endamoeba recorded by Gros under the name *amoeba gingivalis* in 1849 (*Bull. Soc. imp. de Nat. de Moscow*, v. 22, pp. 549-573), by Steinberg under the name *amiba buccalis* in 1862 (*Souremennaya Meditsina*, Kiev, 1862, No. 21-24), by Grassi, under the name *amoeba dentalis* in 1879 (*Gazz. Med. Ital.-Lomb.*,

v. 39, p. 446), by Flexner in 1893, an unnamed parasitic amoeba in the pus of a suppurative osteomyelitis of the jaw (*Johns Hopkins Hosp. Bull.*, Nov. 1892), by Kartulis in 1894 (*Zietschr. f. Hygiene u. Infectioskr.*, 1893, vol. 13, p. 9), of an amoeba from the same source as Flexner's and regarded by Kartulis as identical, named *endamoeba Kartulisi*, in 1904 by Doflein (although subsequently named by Kartulis *amoeba maxillans*), and by Prowazek under the name *endamoeba buccalis* (*Arbeit. aus d. Kais. Gunnedh-litsante*, v. 21, p. 42). All of these, save the examples met by Flexner and by Kartulis, were encountered in the mouth about the teeth and gums, those of the two writers excepted having both been found in pus from abscesses of the jaw. This entire group the writers believe to be identical, and should therefore be known under the original specific name applied by Gros, *endamoeba gingivalis*. The description of the organisms given is by no means satisfactory, and the conclusion arrived at therefore cannot be dogmatically asserted; but the features of identity actually stated or reasonably inferred seem to us to afford sufficient probability to warrant the opinion. All these organisms are found only in the vegetative form, and as such are of moderate size, ranging for the larger examples from 30 to 35 or 40 micromillimeters in diameter when the organism is at rest, with smaller examples (when at all referred to) of from five or ten micromillimeters diameter upward. Variation in motor activity prevails in the different accounts; but it must be granted that this feature is open to no little chance of difference from the personal equation in observations, and too from actual differences in motility possible in any individual amoeba at different times, in different media and subject to different environments of temperature or other factors. The writers have noted decided differences in activity of movement of the amoebae found in material from different individuals observed the same day, differences in the amoebae of the same subject upon different days; and have frequently noted marked variation in activity of a single amoeba in the course of a number of minutes of isolated observation. They are not disposed to consider the differences indicated by the different authors therefore as of any great importance, especially as such differences are apparently not marked. As a rule all these amoebae are characterized by few and broadly rounded, or lobose, to digitate pseudopodia. Kartulis alone urges the extreme length of the pseudopods extended from the amoeba described by him. Yet in later

writings than his original paper he ascribes to them also lobose types of pseudopods; and here again the writers would hold that the variations described are not vitally significant, especially as they have more than once noted pseudopods projected from one isolated amoeba varying within the full limits embraced in the different descriptions referred to. As far as can be determined, in all a clear, hyaline and distinct ectosarc is a rule, contrasting with a more opaque and granular endosarc in which may be encountered coarse globular masses in nutrition vacuoles. There is no pulsating vacuole; and the globules just referred to are probably always undigested remnants of cellular or nuclear structures which the amoeba have englobed. In all forms, as far as can be realized from the descriptions, the nucleus is relatively small and either entirely invisible or with difficulty detected in the living organism. It is poor in chromatin, has a very small "innenkorper," which is separated by a clear space from the nuclear border. As to the latter, Prowazek alone describes a relatively thick achromatic, greenish and refractive nuclear membrane, with chromatin grains collected along its inner surface. Prowazek would ascribe to this membrane an especial rigidity which preserves the nucleus from easy compression and flattening, a point which he offers as specifically differentiating his type from *endamoeba histolytica*. Other writers, who follow him closely, as Leyden and Lowenthal (*Charité Annalen*, v. 29, p. 3), fail to recognize this greenish tinted, refractile membrane; and picture the nuclear border, as the writers are familiar with it, as a delicate membrane lined continuously and thinly with grains of chromatin. The nucleus is usually central or subcentral in position; but we have occasionally found it close to the ectosarc. Certainly in the organisms observed many times by the writers all of the unquestioned features indicated by these various authors as characterizing the amoebae studied by them have been embraced; and they feel justified in holding them as all identical and in requiring therefore a return to the original nomenclature. A number of the writers definitely compare their organisms to *endamoeba histolytica* (presumably referring to the original type and not to the clear form, which was regarded until recently as a different species, *endamoeba tetragena*, with its nucleus easily visible in the unstained parasite); and the writers would acknowledge here that on morphological grounds alone they are unable to make a differentiation from this dysenteric amoeba. They recognize, too, a similarity to this latter species in the

marked proteolytic power which *endamoeba gingivalis* possesses, and in its tendency to englobe and digest rapidly red blood cells as well as other cellular elements.

Of the amoebae which have been found about the mouth the only example which we are disposed to specifically differentiate from the above is the organism discovered originally in two bilateral and symmetrical abscesses of the cheek in an individual who also had pyorrhea alveolaris (to which it was thought these abscesses were secondary), by Verdurum and Bruyant (*L'Echo Med. du Nord.*, Aug. 11, 1907), and later detected again in the pus of a second pyorrhoea case by Bruyant (*Ibid.*, June 27, 1909). This amoeba is similar in its general characteristics to *endamoeba gingivalis* (Gros), but it is peculiar in possessing a relatively large nucleus which is almost solidly chromatic; and is known as *endamoeba pyogenes* (Verdurum and Bruyant). It is apparently distinct from all the other parasitic amoebae of man, although examples of another amoeba with large and richly chromatinized nucleus, described by Smith and Weidman (*Univ. of Penna. Med. Bull.*, Sept. and Oct., 1910) in 1910 under the name *endamoeba mortinatalium*, were found many years ago by Ribbert (*Centralbl. f. Allgem. Pathol.*, 1904, v. 15, p. 945) in the parotid glands of children; and it is possible that further study may show these to be identical.

Reference may here be made to certain criticisms of the writers' attitude as to the pathogenic importance of these oral endamoebae. Questions are asked—why, when so many other workers have noted the presence of endamoebae in the mouth and have ascribed to them no noxious abilities and have in some instances (as in case of Chiavaro) specifically referred to them as favorable agents engaged in destroying the bacteria of the mouth, and when, too, there are so many other living micro-organisms associated with these endamoebae, more than one of which might be equally suspected—why under such circumstances are the endamoebae selected as the principal or only culpable agencies? And objection is made that the classical postulates of Koch have not been fulfilled, and that the claim of endamoebic pathogenicity is therefore not demonstrated. We may answer these objections here as well as not in categorical manner; but we acknowledge at once that our answers cannot thus far be absolute. They surely, however, we believe, offer a rational basis for belief, even though that basis is not complete. Our suspicion, at the time only tentative, that these endamoebae might be of importance in causing Rigg's dis-

ease arose from the uniformity of recognition of these protozoa in a series of pyorrhoea cases which we were examining in the spring of 1914. That suspicion grew sufficiently strong to make us wish to subject them to some actual test when a little later it became evident that persons without any pyorrhoea lesions are free from these parasites. Efforts to cultivate and isolate the endamoebae were made, so as to make the prosecution of Koch's rules a possibility; but our efforts were then and still are without satisfactory results. It is true that when the contents of a pyorrhoea pocket were placed in fresh raw egg white and kept at room temperature, living and moving amoebae were found about the place of implantation for as long as twenty-four hours; later, with the same temperature, living specimens were found at 49 hours after inoculation in a medium made up of human blood and egg albumin. In both small amoebi-form bodies, some slightly motile, were detected and believed to be evidence of multiplication by budding (no cysts being found). But at the same time there was luxuriant bacterial growth, and the amoebae seemed to remain invariably in close association with the bacteria. It has not been possible therefore for us to establish any but the first of Koch's rules thus far; although it is to be hoped that in the future some one may be successful in cultivating and isolating these protozoa and thus come to a position where proper attempts to fulfil the remaining postulates may be made. And yet, were there no further evidence to be presented, the case would not be hopelessly at fault. The best methods of treatment in vogue for years have been those directed by mechanical and chemical means to cleansing the pockets of some type of progressing and self-perpetuating cause. The efficiency of such a measure depended upon the thoroughness of its application, and this was largely a question of the individual operator. We inclined with others to depreciate the primary importance of such a purely mechanical factor as tartar formation, and to appreciate rather the prime efficiency of some vital agent. Yet local antisepsis certainly lacked the fullness of success ordinarily realized by surgeons elsewhere in the body in sites of bacterial infection; and bacterial vaccines were not either partially or markedly successful with such uniformity as would exclude some other agent than the complex groups of bacteria utilized in the manufacture of these vaccines. It was natural therefore that the impression of possible importance of these protozoa should have become strengthened. No one doubts the pathogenic importance of Hansen's bacillus

in lepra, even if there be unending debate as to the various strains of acid fast bacilli which have been grown, and as yet there is no proof by Koch's rules that any of the cultivated strains or the possibly uncultivable Hansen organism will experimentally provoke the lesions characteristic of leprosy. No one doubted the pathogenic absoluteness of the protozoa of malarial blood, although an interval of more than thirty years elapsed between Laveran's original announcement and the admirable work of C. C. Bass which resulted in the successful cultivation of these haematozoa and the production of malarial phenomena when they were inoculated. No one to-day has cultivated the dysenteric endamoebae, and all successful inoculations have been performed by introducing not only the endamoebae of an actual dysenteric stool, but also the countless bacteria associated therein. Yet no one refuses to believe that *amoeba histolytica* is an important factor and perhaps the sole one in the production of tropical dysentery. This position, then, would not be untenable logically were there absolutely no further evidence to offer. But in the lack of ability to consistently follow the accepted steps of procedures, it was natural to contemplate the recent history of dysenteric treatment by means of emetin. This drug, one of the alkaloids of ipecac, had been studied by Vedder, of the United States Army, in its influence upon forms of amoeba which had been successfully cultivated in vitro; and from his observations was extremely lethal, even in high dilutions, to these protozoa. Rogers, of the English Medical Service in India, with this fact as a basis, employed the drug hypodermatically in amoebic dysentery, with the most happy results; and to-day the remedy is regarded as the most potent amoebicide at our command for use in therapeutics. Its value as a bactericide has been insufficiently studied; but the evidence we do possess indicates that it is but feebly active at best for such vegetable micro-organisms as have been subjected to its influence. It would be unreasonable, because the ideal means of proof could not be obtained, to refuse to discover what evidence might be acquired by employing this agent. It was used by us in the hope that it would destroy the amoebae, and in the further hope that if these be important to pyorrhoea the suppuration would be ended; and these hopes were promptly and richly realized. The proof of their pathogenicity is not perfect, we admit, even though an efficient remedy has been provided; but the probability of the correctness of our suspicions is sufficiently established to make the assumption of pathogenicity of these enda-

moebae a credible working theory. As such it will remain until it is finally verified, or absolute proof to the contrary presented; and the writers feel that in any academic discussion or in any experimental procedures leading into discussion, at this time the burden of proof falls upon the objectors. We have at no time refused the idea that the associated bacteria are contributing factors; as above stated, we suspect they and the amoebae are linked in a symbiotic chain—and a chain is broken when any link of it is shattered. So, thorough local antisepsis and proper vaccines may also be expected, by destroying the bacteria, to yield beneficial results; and in many cases the association of the two measures may hasten and may more certainly establish a final cure. But because of its convenience of application, its almost uniformly good effects, the absence of any painful effects upon the patient, we feel that emetin should stand first among remedial agents and measures when ordinary amoebic pyorrhoea cases present themselves. There is reason to scale the teeth in connection with the treatment, but the scaling should be gently done to disturb the loosened tooth as little as possible; and indiscriminate instrumentation is painful and often is really meddlesome in that it results in mechanically breaking the wall of the pockets and further disturbing the toxic and microbic contents into the surrounding tissues. Antiseptics are surely indicated, yet indiscriminately applied and in too high concentrations they may themselves destroy tissue which we should endeavor to preserve. Vaccines are in theory admirable, and in practice they often realize their purpose; but their use is not always convenient, is sometimes attended by unpleasant general reactions, and they are sometimes utter failures from some fault of technique, presumably.

Emetin, as employed in dental practice of one of us (Barrett) is practically always beneficial in amoebic pyorrhoea, and in over 95 per cent. of cases has proved curative. Three different methods of administration have been employed, including (1) local instillation of a one-half per cent. aqueous solution of emetin hydrochloride into the pockets and along the dental trough and between the teeth; (2) the hypodermatic administration of the same salt in doses of from 1-6 to 2 grains daily; and the oral administration of ipecac in its alkaloids in some manner devised to promote action until the drug has passed through the stomach and gained the duodenum. For this last purpose pellets may be used coated with salol or keratim, or the tablets made by Lilly & Co., of St. Louis, known as *alcresta ipecac*,

in which the alkaloids are held in physical absorption by silicate of aluminium in the presence of acid or neutral media, but yielding them when in alkaline media. In the few cases in which we have made trial of this mode of medication the results have not been of such a character as to encourage the routine administration of the remedy in this manner. Our best results have been obtained by local application of a solution of emetin hydrochloride, and for uncomplicated pyorrhoea we believe it superior to hypodermic administration of the remedy. When systemic complications exist, when amoebae can be demonstrated in such situations as in the tonsils or in some of the sinuses which are not readily reached by local administration, hypodermic administration seems to us necessary; and doubtless it would on general principles be advisable to complete the ordinary pyorrhoea treatment by one or two doses given by hypodermic injection. Alone it has not in our hands been as efficient for pyorrhoea as has been claimed by Bass and Johns, who first advocated this method of the use of the drug. Repeatedly after a number of hypodermic injections living and moving amoebae have been found by us in material taken from pyorrhoea pockets. Probably this mode of attack is efficient for all amoebae which are within the body tissues, to which the drug is borne by the lymph or blood; but it is questionable whether the remedy reaches in efficient amount those amoebae which are upon the surfaces of the mucous membrane or are situated in the interior of the pyorrhoea pockets. The same point has been raised in its use in dysentery, where it apparently kills the parasites in the wall of the colon and is followed by the healing of the ulcers; but where for a longer or shorter time after the disappearance of dysenteric symptoms there are still met motile amoebae in the dejecta. It seems more sure in its action if brought by local application in full concentration in contact with the amoebae. Those in the pocket are apparently quickly destroyed; some of the drug undoubtedly is absorbed through the wall of the pocket, and this may be relied upon to kill those few which may be embedded in the tissues. We have watched under the microscope the effect of a half per cent. solution of emetin hydrochloride upon the active amoebae in preparations from pyorrhoea cases, the animals in a few minutes becoming motionless, rounded, their ectosarc broadening at the expense of the endosarc until finally nearly the whole amoeba took on a clear, refractile, hyaline appearance, and was apparently dead. The same appearance has been seen in some of the parasites

found after one or two treatments with the remedy in material taken from the mouth of patients. In applying the remedy we find it convenient to make up an approximately half per cent. solution of the drug, dissolving a 1-6 gr. hypodermic tablet in two cubic centimeters of distilled water or normal saline solution. This is then introduced into the pockets with a syringe having a blunt needle, reaching well down to the bottom of each pocket and sweeping the needle point laterally, so as to insure full penetration into all its parts. This should be done with gentleness. The wall of the pocket should not be penetrated, as the mechanical harm thus done is in itself capable of causing some additional inflammatory reaction; and the needle, too, is like to carry some of the infectious material and toxins into the surrounding tissue. Toxic absorption thus exaggerated may occasion some general disturbances, as a slight temperature elevation and headache; and theoretically at least there may be a chance of providing for wider generalization of some of the bacteria and resultant secondary lesions either deeper in the gums or at a distance in some other body structure. As the needle is withdrawn the pocket is left filled with the solution, and manipulation of the gums should not be practised lest it be forced back into the mouth. One pocket after the other is thus dealt with; and a small amount is to be allowed to flow along the dental trough and between the teeth, and especially about any fixed mechanism in the mouth. In some persons the contact of the drug causes an unpleasant dryness of the mucous membrane, and its repetition may be productive of a slight soreness from a catarrh it occasions. This is best prevented by first lightly anointing the lips and gums with vaseline as a protective. Usually no after treatment is required. In going over the entire mouth, even where there are numerous pockets, no more than the two cubic centimeters of solution prepared should be used at any one time; as some of it is invariably swallowed and there is danger of thus causing unpleasant nausea and vomiting. The smaller the amount required the better. Treatments such as here outlined should for the average case be repeated only for five or six days, then every other day for five or six times more. During the course of the work every few days microscopic examination should be made of material from the pockets; and the disappearance or persistence of the amoeba followed as a guide in determining the actual length of the period of treatment. Usually in two or three days the suppuration ceases and the amoebae disappear, the gums begin to lose

their turgid appearance and the teeth seem to become tighter; and ordinarily long before the end of the usual period of attention the patient regards his mouth as practically well. It is impossible to say at this time what chances there are for regeneration. Probably the most that can be expected is the complete organization of the inflammatory cellular infiltrate in the walls of the pocket and about the tooth. It is unreasonable to suppose that receded gums can be restored to their original condition. Nor is there the least assurance that reinfestation, from whatever common extracorporeal source these organisms come to most of us, will not take place. The best that can be offered in reply to questions bearing upon this point is that repetition of the remedy should be quite as effective in recurrences as in the primary attacks. There probably can be something done in the way of prophylaxis by any efficient cleansing measures; and perhaps the use of ipecac or a weak solution of emetin on the tooth brush, as advocated by Bass and Johns, may be of especial value. Among other drugs for this purpose we have made use of the fluid extract of *chapano amargosa*, a plant growing and used in Mexico and Western Texas for amoebic dysentery. It is objectionable because of its bitterness, but has seemed to have some curative value in the actual treatment of pyorrhoea and as a protection against reinfection when applied upon the brush in cleansing the teeth. Theoretically a number of known amoebicides may be tried in the same way, as quinine or thymol; and doubtless in time experience will approve some one or other of these analogous agents as of prophylactic value.

Discussion of Dr. Barrett's Paper

BY DR. ANDREW J. McDONAGH, TORONTO.

ALLOW me to express the pleasure I have felt in listening to Dr. Barrett address us this evening, and to assure him that we in Toronto have awaited with no little anxiety for his utterances on this occasion.

We in this Canada of ours consider it a rare treat when honored by distinguished investigators in anything relating to our profession, and we think that no meed of honor or, for that matter, pecuniary benefit is too great for the man who by his unremitting efforts elucidates any of the problems which, when not solved, stand in the way of proper reasoning rational treatment. But there is always some-

thing to be guarded against in the solving of these problems, and there are always parasites in human form who make use of the work of investigators such as Dr. Barrett for their own pecuniary benefit and to get some cheap notoriety, consequently it devolves upon us as a dental profession to understand those subjects and to be able to discuss them intelligently, and thereby protect ourselves and the general public.

Before entering into discussion of Dr. Barrett's paper, it is only fair to Dr. Barrett, to the others who will enter into the discussion, and to myself, to say that Dr. Barrett found it impossible to send his paper on ahead of him, therefore we who must discuss it have not had the opportunity of seeing the paper, and as a consequence may not be able to cover all the points of interest in it. However, we will do the best we can.

Dr. Barrett has taken it for granted that we are all familiar with bacteria and protozoa, but lest there should be some one here who is a little rusty on that point, I might say, with his permission, that bacteria belong to the vegetable kingdom and the entamoeba is a protozoon and belongs to the animal kingdom, in fact the simplest form of animal life. Is that not so, Dr. Barrett? (Dr. Barrett: That is right.)

This is a new world of investigation into which Dr. Barrett has introduced us, so far as the etiology of this disease or these diseases which have been spoken of under the head of pyorrhoea alveolaris are concerned, and before going further into discussion of this paper I would like to suggest that we use the terms, as much as possible, included in the nomenclature of the American Academy of Oral Prophylaxis and Periodontology based on "Odontos—a tooth"—"Peri, around," and "Klan, to break"; forming the term "Periodontoclasia, or Dental Periclasia."

At different times in the history of our profession we have had different theories advocated by different investigators. As far back as the year 1100 an Arabian physician put forth a theory and described Dental Periclasia and gave us a treatment for it, ascribing it principally to mechanical irritants. Numbers of men, living or recently dead, have from time to time tried to solve the question. Each one is sure that his particular view is the one and only right one. Several investigators in Europe, including Great Britain, having constantly discovered streptococci, believed that the cocci were responsible for the malady in all its forms. About ten years ago Dr. Goadby discovered in every case a

couple of varieties of staphylococci, therefore, naturally enough, came to the conclusion that the staphylococci were the cause of the disease. Being a man of action, he immediately made an autogenous vaccine, injected his patients, I believe sub-clavicularly first, at all events sub-cutaneously, and had marvellous results. I remember reading a paper of his in which he said in every case where he had used vaccine he had had a cessation of pus forming and apparently healing.

In later years Dr. Goadby has discovered a streptobacillus of which we will speak later. But we do not need to go to Europe for men who have had theories regarding the etiology of this disease. Many on this side of the line have had their particular theories. Dr. Medalia, of Boston, discovered that dental periclasia was the result of an infection of diplococci which could not be distinguished from the pneumococci. Morphologically or culturally, and having by careful technique discovered these organisms in every case, he knew they were the cause of the disease.

He made a vaccine, injected it in 115 cases, and marvelously cured nearly every case. Dr. Laymon, in a paper which I heard him read at Cedar Point, Ohio, claimed wonderful cures as a result of injecting autogenous vaccines of mixed bacteria, and so on down the list. Then Dr. Timothy Leary, of Roxbury, Mass., tells us that we are entirely mistaken, that we have been using the wrong germ, because we have not been culturing properly. He demonstrates that in every case if you look in the right way and make your culture in the right way, you will find a prolific growth of the fusiform bacillus, and I will say nothing derogatory to this theory, because if I lean towards any bacteria as a constant concurrent cause with others, I must accept the fusiform bacillus.

Now the latest, most stylish and up-to-date theory takes us out of the bacterial world altogether, and lands us in the realms of the protozoa, culminating in the theory of Dr. Barrett and the endamoeba buccalis.

Now we are travelling in a hitherto uninvestigated kingdom, and is it not wonderful how fast we have travelled in such a short time. We are told by the original investigators that in all probability the amoeba is the cause of dental periclasia, but we are told by their followers that there is no doubt of it, and that at last we have discovered a medicine which is a specific for all forms of the disease.

This fact is advertised quite extensively in the daily press, and one wonders if in a short time there will not be

a lotion or tablet on the market to absolutely cure or positively prevent every vestige of gum infection.

Now let us study this new theory for a moment and see what we have been told. One of the things we have been told is that the amoeba buccalis is found in every pocket where we have suppurative periclasia or pyorrhoea, and that it is not found on healthy gum tissue; also that it cannot live in tooth cavities where there is an acid reaction. Now, gentlemen, taking it for granted that these statements are true and that there is sufficient clinical evidence to corroborate them, a fact which I dispute, is there anything strange about it, anything extraordinary? Would it not be extraordinary if amoebae of one form or another were not found in superficial pus in an oral pus pocket?

There is not a cesspool from one end of the land to the other, there is not an eavetrough with stagnant water in it any place in this country, nor an aquarium which does not boast of millions of amoebae; they are almost as common as the dust on the street, but they have to have certain environment in which to live, and one particular attribute of this environment is that it must be either neutral or alkaline, but must not be distinctly acid. On the other hand, bacteria such as the cocci and the fusiform bacilli need slightly acid medium. Dr. Leary tells us that until he used acid milk he had no success in growing the fusiform bacillus, and informs us that the fusiform bacillus grows in the pyorrhoea pockets because the other organisms there supply the acids. Considering these facts, there must be two conflicting thoughts come to our minds. There is no doubt that in a mouth in which there are a great number of carious teeth, in the process of decaying, that you are not apt to find active dental periclasia, and where active dental periclasia is in evidence, the teeth are not decaying. This supports Dr. Barrett's theory, because the acid produced by the organisms in the cavities would interfere with the propagation of the amoebae. On the other hand, the lack of that acid would permit the amoebae to work.

Now let us see what instructions we get that we may find the amoebae. We are generally told to clear away the superficial debris and pus from the top of the pocket, push an instrument down to the bottom of the pocket and bring up the amoebae (taking it for granted of course that the amoebae are down there). In fact I read an article in the *Dental Cosmos* the other day where Dr. Bass and Dr. Johns' work was reviewed by the editor of the *American Journal of Clinical Medicine*, who tells us the way to get the amoebae

is by pushing a tooth pick down to the bottom of the pocket, or, he says, any suitable instrument.

Imagine a man who has had any experience in bacteriology or protozoology expecting to get from the bottom of a pocket organisms which are indigenous to that position by such slipshod methods.

We used to believe that an abscess at the end of a root, without a sinus, contained staphylococci; now we know that the staphylococcus is not the usual organism found there, if it is ever found there, and we have learned that because of the exact technique which is now observed in finding them. What proof have we that the amoebae (if it has any claim to be the cause) has ever been found in the bottom of the pocket, or which must necessarily be the case, imbedded in the tissue affected. I have not seen any before to-night, and I have not obtained any, but that does not say that they are not there. However, this much we do know, that there are imbedded in the tooth substance, extending right to the bottom of the pocket, bacterial organisms, and we know in many cases there is quite a severe osteomyelitis; in fact, according to Hopewell Smith, Medalia and others, there is always a rarefying of the bony tissue adjacent to the suppurating pocket and an infiltration of bacteria in the tissues surrounding the pocket. We know these organisms, particularly the cocci, which is always present, produce acid bi-products, and the fusiform bacilli, which needs an acid media to live in, are living there in millions; and we know also that the amoebae cannot live in acid medium, and as a consequence it is not found in the deeper layers of dental decay, therefore how can we suppose that the amoebae buccalis gets near enough to the tissue at the bottom of a pocket to have a pathological effect? In opposition to this supposition, several investigators claim the amoebae are not pathogenic but benign. As a matter of fact, where I have found the amoebae in abundance has been in the soft material resting around the necks of the teeth just at the gingival margin, which material always causes an inflammatory appearance of the gum tissue, and no doubt there is a reaction in the tissues which, through prolonged irritation, will lead to a pocket, and I have found them in great numbers in the pus which is exuding from large pockets, but which is exuding slowly. I have made quite a number of slides, stained with carbol fuchsin and methylene blue, and others with Wright's blood stain.

Dr. Box stained and mounted several of these, and I want to here thank Dr. Box for his trouble, and also for

his kindness in making it possible for me to get Wright's blood stain in time to stain the rest. I have brought with me a number of smears, not chosen for any particular reason excepting that we have histories of them. Perhaps you, gentlemen, can find amoebae in them all, but I cannot.

For instance, I have here a smear (No. 1) taken from a pocket at least three-quarters of an inch deep, a young lady 26 years old, and I cannot find an amoeba in it, notwithstanding the fact that it is an extraordinarily large smear. Now with this young lady the history is an absolutely clean mouth, as far as she can make it so; she has been in the habit of thoroughly brushing her teeth since infancy.

Here is one (No. 2) with two smears on the same glass, one taken without any treatment having been given, the other after I had scaled the root almost, but not quite, to the bottom of the pocket.

Here is one (No. 3) with two smears, one taken from the labial side where the gum was loose and one from the lingual side, left lower central, where the gum was closer to the root. You will find a marked increase of amoebae from the loose side of the pocket.

Here is one (No. 4) loaded with the organisms taken from a very loose pocket. Remember these are not stained by Dr. Barrett's method and I am not as expert at finding the amoebae as Dr. Barrett.

Those cases which have a very free flow of pus as a result of deposits, be they salivary or serunal, so long as they are large enough to be sensible to the instrument, are always easily treated, but those are not in the majority in the number of cases we have to treat.

We have many cases where the teeth are loosening and the tissues being destroyed, which, so far as the eye can see, are not suppurative. They are often in very clean mouths; indeed I might say they are always in clean mouths, and if it is ever possible for a concealed pocket not to have amoebae contained therein, these would be the most likely places, and I find by my slides that these are the cases in which I cannot find the amoebae.

Now, with regard to the treatment of suppurative or non-suppurative dental periclasia, where do we stand? As far as I am concerned, this is really where I take issue with the teachings of Dr. Barrett and all his disciples. If any man expects that by the use of emetine he is going to get a short road to a big fortune I very much fear he is doomed to severe disappointment. There is one part in the teachings of these gentlemen which is good, that is, of those who

strictly follow Dr. Barrett, and in that they advise the thorough scaling of the roots, but, gentlemen, you will probably allow me to say from my experience that it is a difficult thing to do, the so-called scaling of the roots, but when you do thoroughly scale the roots and disinfect the tract adequately, if it is necessary to disinfect it, and that has to be matter of judgment for the operator; when you do that, I say, and I speak from experience, you are going to have a cessation of pus and healing in 95 per cent. of your cases without emetine. Then if emetine is any good it is only good for the other 5 per cent., and this is true also of vaccines, although I have had more success with vaccines than I have had with emetine, probably because I have used it longer than emetine. I have only used emetine, injecting it into the pocket day after day, in about a dozen cases, and I cannot truthfully say that I had anything like satisfying success with any of them. I have had partial success with two, that is, I have had a decrease in the flow of pus, but in no case have I succeeded in making it stop. But remember I am only reporting cases which did not yield to my ordinary treatment for this disease. I have tried emetine on a number of other cases without scaling, and I have tried to make myself believe that there was an improvement, but really I cannot.

If your object is to kill the amoebae by injecting the pocket, why not varnish the teeth with shellac and inject the pockets with warm lactic acid? I will guarantee if you do that you will kill every protozoa and all the loose bacteria, not in ten injections, but in one injection, and if you are any way careful at all you will not have some of the material with which you are injecting the pocket escape, go down the throat and act as a severe emetic as emetine will.

I have asked a number of dentists who reside in the United States, and who have been using the material, what success they have had. Of course I have been careful to ask those whom I knew were vitally interested and who would pay great attention to the effect of the drug as distinct from the effect of their manipulations, and in every case they have told me that they have had no success.

You know Dr. McCall here and know of his work. I will read you what he said in answer to my question:

"I have tried emetine and seen it tried on a number of cases. I have not been able to see any decided improvement in any case, and have only hopes for emetine as a possible aid in other treatment and as a possible prophylactic. Am not through experimenting yet.

"*Case No. 1.*—Mrs. Z.—Had lost all but inferior six anterior teeth; very badly inflamed gums, of which some margins were necrotic; bad pockets, considerable pain. Was given ten injections in arm by physician without any local treatment. Reported a slight improvement in feeling; no other improvement discernible. Local treatment with emetin injections gave prompt relief; improvement in appearance, etc. Post-operative medication with emetine produced no further perceptible result.

"*Case No. 2.*—Dr. McG.—Has been under fairly regular prophylactic treatment for two years. Case was quite advanced when undertaken and relapses very readily if allowed to go long without attention. Amoebae found in one pocket; had arm injections. Reported no perceptible effect.

"*Case No. 3.*—Dr. M.—Similar to Case 2 in essentials. Both are prominent surgeons and consider that the treatment has done them no good, although willing to believe there may possibly be 'something in it.'

"*Case No. 4.*—Lieut. N.—An army officer; treated three years ago. Pyorrhoea re-established about lower incisors, as he had been unable to return for prophylactic treatment. Was given local emetine injections by other dentists and claimed to notice a considerable improvement. Pus still found in pockets, which cleared up after scaling of roots and other local measures.

"Other cases all follow the same general lines."

This to me, gentlemen, is very important for our own protection and the protection of the public, because, as I said before, it has been advertised in the daily press as a short road to success, and all the physicians and dentists who have not had time to experiment and understand what is really resultant are carried away, and are apt to be dupes of unscrupulous vendors of nostrums, and are apt to dupe their patients.

I have said very little about the injection of emetine, subcutaneously or intravenously, excepting the reference made to it in Dr. McCall's letter. Knowing what we do of the disease, and what is necessary to cure it, I have not felt justified in experimenting on my patients in that way.

Emetine is used and is exceedingly useful in another field, that is in treating dysentery. De-ementinized ipecac, however, according to Dr. Harris in the *New York Journal* of October, 1914, proved efficacious in treating tropical dysentery.

Renault, in the *Medical Review*, London, of October, 1914, also records remarkable success in treating cholera

in Pondicherry by emetine hydrochloride. On the other hand, in a non-tropical dysentery where there were no amoebae present, a case treated by Dr. Tribondeau, using emetine, had a recovery in three days, notwithstanding the fact that spirochaetes did not disappear. Dr. L. E. Bertram, of Paris, says spirochaeta and amoebae disappear from the stools after four injections subcutaneously, and there are many authorities to tell us that emetine has a very great influence any place in the body in stopping hemorrhages, which will account, of course, for many of the so-called phenomenal recoveries from pyorrhoea, the evidence of which is bleeding gums.

But even with all this testimony in its favor, who will say that half a grain or up to five grains, which is the maximum of a possible dose, mixed with 10 or 12 quarts of blood in the body will make that blood sufficiently germicidal to exude a disinfectant into your pyorrhoea pockets powerful enough to kill all of your staphylococci, all of your streptococci, all of your fusiform bacilli, and every other organism, animal or vegetable, which reside therein.

Believe me, gentlemen, much as I admire Dr. Barrett and Dr. Smith, and much as I thank them as one of the profession for their investigations in this subject, I am going to stick to my old doctrine and my old efforts of trying to make a surgically clean wound containing a clote, as near as I can, of normal blood, and depend upon nature to do the healing.

Discussion of Dr. Barrett's Paper

BY DR. JOSEPH S. GRAHAM, TORONTO.

DR. BARRETT is to be congratulated on his paper, to which we all have listened with a great deal of interest. It would be a great deal easier to reply to Dr. McDonagh than to the writer, because, while I do not agree with a great deal that Dr. McDonagh has said, I must confess that I do not know enough about amoebic diseases to discuss the paper as I should like. This is not the result of a natural inertia, for I went to a good deal of trouble to see the University men in this regard, but was unable, either from them or from the library, to increase to any extent my somewhat limited knowledge.

Dr. Barrett is practically opening up a new subject—new ground—and until we have had an opportunity to do some work along these lines it would not be fair to criticize or to

make sweeping statements. My own feeling, however, is that it is impossible to conceive of pyorrhoea as being due to any single causative factory and that, if the amoeba is found so constantly as Dr. Barrett thinks it is, it cannot always play the principal part. It probably is quite true, as Dr. Barrett states, that as the amoeba disappear so the disease condition clears up. The probable reason for this is that if local conditions are rendered unsuitable for amoebic growth and life they would be also unsuitable for the growth of bacterial forms. Might it not be that the amoeba buccallis uses up the oxygen locally and so permits the development of the anaerobic spirochetes? It may be that the amoeba actually carries bacteria with it to the part, but I cannot believe that the disease we speak of as pyorrhoea is the reaction of the parts to the toxins of or the end products produced by the amoeba buccalis.

As regards the use of emetin hydrochloride, I am again at a loss except that the reports from the local men have not been glowing; possibly this may be remedied by improved technique, by following more closely the directions of Dr. Barrett. I would like to see used in this connection oxygen, quinine hydrochloride solution and washing with normal salt solution. We might arrive by this means at a clear knowledge of the part played by the amoeba and the use of the emetin as a specific.

When Dr. McDonagh was speaking of the various methods by which he had effected a cure in pyorrhoea I was reminded of a few cases that I treated by intravenous injection of Salvarsan. This was some years ago, when arsenic was first used to any extent in the treatment of syphilis. It was not with the idea that pyorrhoea had anything to do with syphilis, but it was from the fact of the fairly constant presence of a spirochete form, and from the association of pyorrhoea with pernicious anaemia that I got the idea. Four cases were so treated. One was quite cured (the apparent cure lasted for at least four months, when I lost track of the patient); one I thought was improved; the other two I am certain were not improved. Dr. Graham Chambers had something of the same experience. The further treatment along these lines did not appeal to me.

Dr. Barrett has been modest in his claims. He does not pretend to have arrived at the end of his work, but admits that only a beginning has been made. For this he deserves great credit. It would not be fair of me to take up more time, as I know that Dr. Barrett has much to say to Dr. McDonagh.

Dr. Barrett, in Closing the Discussion

I AM anxious to have it understood that I am here to present a report of work carried on by Dr. Smith and myself; and I am unwilling to be led into a discussion of the views of others, and consider as rather out of place any reference at this time to the work which has been done by others whom one of the speakers has characterized as "disciples." Doubtless these other workers are best able to prove their own statements, and at any rate I feel that we are responsible only for our own published declarations.

Neither Dr. Smith nor I have ever claimed that these oral endamoebae are the sole agents capable of producing the condition known as pyorrhoea; nor have we said that emetin hydrochloride will stop every periodontal suppuration. We have been careful to point out that while a very large proportion of cases have in our experience cleared up fully upon use of this agent, yet, after the disappearance of the amoebae, we have found in a few cases a persistence of a slight grade of suppuration. In such cases we recommended the use of a weak iodine solution (one per cent. of iodine in normal salt solution) applied locally in the same way as the emetin is applied, to the lesions directly. We are, of course, aware of the presence in the pyorrhoea lesion of numerous other micro-organisms, some of animal nature, but the bulk of vegetable character; and we have not hesitated in the paper just presented, as well as elsewhere, to suggest the possibility of a close symbiotic relation existing between the endamoebae and the bacteria found in association.

Numerous bacteria, including spirochaetes, have been found associated with the amoebae of dysentery; and several theories based upon this association have been promulgated in explanation of the pathogenesis of dysentery. By some it has been held that the disease is really due to the toxins of the bacteria supposed to be set free when the bacteria have been ingested and digested by the amoebae; by others, that the amoebae are merely the carriers of the more important bacteria into the tissues, thus insuring the penetration of the bacteria. No one doubts, after the constant evidence of sections of the colon in amoebic dysentery or the observation of Schawdinn of the active movement of the amoebae between the lining cells of the colonic mucosa, that in dysentery the amoebae penetrate the tissue of the bowel wall. Equal evidence of the penetration by the oral

endamoebae into the soft tissues of the gums is not available; but the writers believe that the arguments advanced in the paper of the evening that such penetration does take place cannot be set aside.

The argument that amoebae, being common dwellers in water, cesspools and other comparable situations, ought for this very reason be found in the mouth seems to me of little force. There is, too, an important difference between the free-living amoebae found in such extra-corporeal places and the parasitic amoebae inhabiting man and other animals as their proper habitat; and as only one evidence of such biologic difference might be cited the possession by the free-living forms of the special organelle of the contracting vacuole and its absence from parasitic varieties. Because some amoebae are free-living and non-pathogenic is no reason why others should not be capable of producing disease. One might as well argue that because there are saprophytic bacteria there are no pathogenic examples among the parasitic forms.

It is of little moment and in no sense an argument against the study of pyorrhoea by dentists that much time is likely to be expended in searching for the endamoebae. Facility must here, as in all other procedures, come with practice; and for myself I can only say that, whereas at first it required many minutes in every case before I was able to distinguish the parasites, I am usually now successful in finding them in the average case in but one or two minutes.

It is scarcely a matter for serious consideration that, if emetin hydrochloride be accepted as an efficient remedy for pyorrhoea, the treatment of these cases will pass to the general physician, who will at once clear up all lesions by hypodermic administration of the drug. Were it true for many it would be a welcome release from a troublesome lot of rather bothersome cases. But actually I doubt whether the hypodermic administration of the remedy will ever come to be regarded by experienced persons as a substitute for its more efficient local administration, which will hardly pass from the sphere of the dental surgeon. It is impossible for me to be specific in answer to the question whether iodine cannot be held to be an amoebicide. We must not lose sight of the property of these protozoan organisms to encyst in the face of harmful surroundings, and thus by providing themselves with a protective wall to escape destruction, even though the germicide used prove its ability to destroy the associated bacteria. I have frequently used iodine in the treatment of pyorrhoea, long before I knew

of the existence and properties of emetin, but I have never observed comparable results from iodine to those I have obtained from emetin. The successful results obtained from the latter remedy are apparent not only in my own experience. Scarcely a day has gone by recently in which I have not received letters from one or more men in different parts of the country telling of the beneficial results they are obtaining. Some days ago I was demonstrating the mode of applying the remedy before a group of visitors at the opening of the new dental buildings at the University of Pennsylvania. Four men were standing at a given moment directly before me, to whom I directed my immediate conversation. They had all been using emetin in pyorrhoea, but stated one after the other that they had been unable to see any improvement in the cases they had thus treated. A rather elderly gentleman back of me, whom I had not noted until this time, said at once: "Then, gentlemen, you cannot see!" And I cannot help suspecting that many of those who have declared themselves unable to obtain satisfactory results are also wilfully blind.

Dr. Graham's observation in regard to the recovery of a patient with pyorrhoea after administration of salvarsan is of more than passing interest, even though other patients similarly treated failed to show equal results. Can it be that there is a special part in certain cases played by the spirochaetes of the mouth? Dr. Smith and I have felt for some time that perhaps a fair estimate of the part played by the spirochaetes might be determined clinically by the employment of this spirochaetocide of Ehrlich's.

I cannot agree with Dr. McDonagh in his dictum concerning the formation of cementum. He would apparently hold that this tissue is a derivative of the tooth structure itself, whereas, while it has been definitely pointed out (as by Dependorf) that the cementum is in close structural relation with the dentine and receives twigs of dentinal nerves, it is in reality a derivative of the peridental connective tissue, growing from the layer of cementoblasts of the peridental membrane. And the fact that Dr. McDonagh has found a formation of cementum over the broken surface of a remnant of root left deep down in a socket does not to my mind suggest that it has arisen in any way from the tooth itself, but rather that an extension of the cementum-forming cells had taken place over the broken surface of the root from the contiguous peridental membrane.

Technique of Oral Prophylaxis

ARTHUR DAY, D.D.S., TORONTO.

THE technique of oral prophylaxis depends somewhat on the financial position of the patient. The following technique applies to the class of patients who are not rich (stenographers, bookkeepers and those who have fairly good positions), who in deciding if they will have prophylaxis at regular intervals have also to consider whether or not they can afford it. The class, let us say, who can afford four one-hour treatments a year at a fee of from sixteen to twenty dollars per year.

It must be remembered all through the operation that no time can be lost if a prophylaxis which is done only every three months is to be performed efficiently in one hour. The only way to attain efficiency in the above class of patients is to have system in the procedure, and a minimum of waste time. These considerations make an assistant absolutely necessary.

The technique, in the order in which it is performed, is as follows: Blow out all soft matter from between teeth with spray; then pick out any soft matter left with explorer. Remove all tartar, trim off all overhanging edges of fillings and polish fillings having rough and pitted surfaces. Trim cervical edge of gold crowns that do not fit properly, so they do not impinge on the gum. These operations may sometimes require the whole appointment, but they are necessary. In such cases the polishing of the teeth has to be postponed until the next appointment—three months.

While teeth are being thoroughly scaled, the assistant gets ready the outfit of instruments, etc., for the polishing process. This consists of an orange wood stick whittled to a thin spatula-shaped point; two double-end Kuroris holders, one fitted with flat points and one with round points; Cutter's floss silk, sizes R and P; linen strips, a small glass of moistened pumice flour and one of disclosing solution. The assistant should also keep all these renewed as occasion demands during the operation.

Apply disclosing solution to the labial and buccal surfaces of one-half of the upper teeth—the right or left—holding the lip out of the way. Spray solution off the teeth. If the remaining stain shows on the entire surface of all these teeth, go over the teeth with the engine. (This

is necessary if the prophylaxis is to be done in one hour.) In ordinary cases polish off stain that remains with flour of pumice carried on a wooden point. For the incisors the orange wood stick; for the posteriors a Kuroris flat point carried in a Kuroris handle. The Kuroris points should have the corners filed off so they will not injure the gum. The point in polishing should be moved in the same direction as the gum line; if the movement is towards and from the gum, powder is apt to be packed under the gum margin. The points used should not have the flattened surface concave shaped, but should be flat, so that the greatest possible area of point is in contact with the tooth while polishing. Nor should they be of too hard a wood. A medium soft wood becomes loaded with the powder better. It is for these reasons that a Kuroris point is recommended in preference to an ivory point. The proximal surface of the tooth is polished with the pointed stick, filed small enough to fit in the approximal space.

The remaining powder is, after the polishing, cleaned off the teeth with the spray. The direction of the spray should be such as not to blow the powder under the gum margin. If only three or four teeth are to be cleaned of powder, apply disclosing solution to the next teeth to be worked on before spraying off powder, and then the one spraying and spitting-out does for both. After going over labial and lingual surfaces of uppers, polish approximal surfaces with Cutter's floss silk. Pass as wide a piece of floss as will fit into each approximal space. After it is placed have assistant charge it with pumice and then hold lip out of way during the polishing, also keeping mouth open till operator uses spray, which will prevent patient getting the powder all over the mouth. Use the round point on the under surface of a bridge, as that surface is generally concave. Where there is no facing (a wash-out bridge) the under surface may be cleaned with a linen strip or wide Cutter's floss charged with pumice. Polish occlusal surfaces with the wheel brush in the engine.

The same technique is used for the lowers, except that the assistant uses the saliva ejector, and endeavors to keep the teeth from being flooded for as long a period as possible or desired.

After all teeth are gone over the disclosing solution should be used to see if any place has been insufficiently polished.

The teeth should now be examined for decay and for faulty contact points, during which the assistant should be

polishing partial plates, if the patient has any.

The conversation during the hour should be confined to explaining to patient the proper way of using the floss and to impressing on him the number of surfaces of the tooth there are to be cleaned.

When the operation is completed the proper way of brushing the mouth should be demonstrated by the dentist or the assistant. The only way this can be done is by brushing one's own mouth. The proper make of brush should be prescribed.

As to the fee—it is five dollars an hour of no wasted time. To those who cannot afford that fee—about one in three of the people mentioned in the beginning of this paper—it is four dollars an hour, or sixteen dollars a year.

A dentist can afford to do prophylaxis at a smaller fee than he can other dental work, on account of the fact that the prophylactic appointments are made to somewhat suit his convenience, and he can work them in when he is not rushed with other work.

The fee agreed upon to be charged and the length of appointment necessary for each patient should be entered in the book containing the list of prophylactic patients, how often a year they are due, when next wanted, and whether they are to be notified by telephone or letter. This information with any other points the dentist wishes to note. Needless to say this book is not open to inspection by the patient.

The following is a good formula for disclosing solution:

R	Iodin crystals	50 gr.
	Potassium iodid	15 gr.
	Zinc iodid	15 gr.
	Glycerin	4 dr.
	Aqua distillata	4 dr.

Mix; put up in glass-stoppered bottle.

Physics of Dentistry—an Important Branch of Study for Dental Students

THOS. COWLING, D.D.S.,

Professor of Metallurgy, Royal College of Dental Surgeons.

A REVIEW of dental achievement goes to show that the favorable position now held by the profession is due, in a large measure, to the efforts of a comparatively small group of investigating practitioners with scientific training, who specialized in particular branches of their work. Wells introduced, against great opposition, his new anesthesia; Black, after exhaustive research work, gave to the profession his perfected amalgam alloys; Taggart contrived a satisfactory means for casting metals. All these men attained success only after long and sustained efforts. We are all justly proud of these pioneers. We aim to prove ourselves worthy followers of such men, and look forward in expectation of the fulfillment of Sir William Osler's prediction that "the next great thing in the matter of public health will come from the dentists."

This is surely one of the greatest tributes ever paid to the profession of dentistry. There comes with it, however, a stern call to duty—a peremptory command to live up to our opportunities. This means work for all who have the interests of dentistry at heart. How is success to be attained? The answer is, specialize! The twentieth century has been aptly termed the age of specialization. In the commercial world to-day the crying demand is for men thoroughly trained in some one particular branch, and this spirit has also made an insistent appeal to the professions. Thus we find the medical fraternity split up into its different branches; surgery separated from medicine, etc. We find some men making a study of some one particular organ of the human body and limiting their practice to the treatment of the pathology peculiar to that organ. Some claim that dentistry is a specialized branch of medicine, yet here again we find certain dentists treating orthodontic or pyorrhea conditions only. The logical conclusion to be drawn from the trend of the times is that life is too short to cover too comprehensive a field of knowledge, and that it is better to know one thing well than to have a little knowledge of many things.

The teaching of physics to dental students has always

been of a more or less general character—a course suitable, say, for one pursuing a general course in Arts. Undoubtedly benefits accrue therefrom. It may be, however, that the time has arrived when it would be good policy to give our students special instruction in those departments of physics pertaining particularly to dentistry. Such a change would be, in effect, but a reversion from generalization to specialization.

The following might be suggested as a few subjects suitable for consideration by the student of dentistry:

I. (a) Electrical Energy—*Light*—as illustrated by the X-ray, etc. (b) Electrical Energy—*Heat*—as illustrated by the cautery, water-heater, warm-air syringe, porcelain furnaces, etc. (c) Electrical Energy—*Power* (Magnetism)—as illustrated by the motor, etc.

II. Electro-therapeutics—as illustrated by the ultra-violet rays, ionization treatments, etc.

III. Light—involving the use of lenses, etc.

IV. Heat—explaining methods of melting metals, soldering, etc.

V. Phenomena of Castings—with consideration of atmospheric and steam pressure, centrifugal and other casting devices.

VI. Physical properties of metals having special reference to their fluidity, fusibility, ductility, malleability, conductivity, etc.

VII. Study of dental dynamics—as illustrated by forces of stress, etc., involved in masticatory operations; resistance to strain called for in construction of appliances for dental restorations. Almost every branch of dentistry involves consideration of this department of physics.

VIII. Sound—the acoustics of the oral cavity hold the interest of students of prosthetic dentistry.

The study of electricity must needs have an important place in the curriculum of dental physics. A casual survey of any dental operating room will serve to demonstrate that a large part of a modern dental equipment is electrical. Until recently the use of electricity was confined, perhaps, more to those having practices in the larger centres of population, but to-day the outlying districts are securing the benefits of electrical power—thanks to the aggressive policy of our Provincial Government—and soon even the wayside settlements will be making use of the “silent power.” It is well then for our students to train themselves in the use

of electrical appliances. They should be familiar with the X-ray. Recent investigations claim for the X-ray certain therapeutic values. Here is a field for investigation. It would be useful for the student to become acquainted with the various forms of electrical energy—how to reduce a current of a given strength to that of a desired strength. The construction, properties and use of storage batteries would call for consideration. Dental literature contains frequently suggestions as to the use of electrical appliances in certain forms of dental treatments. Students ought to be in a position to make use of such information. A general study of physics will hardly qualify them for this.

Within the past few years important advances have been made in the Department of Prosthetic Dentistry. Various devices have been brought forward to solve the difficulties of anatomical articulation. The great mass of literature upon this important subject teems with conclusions based upon the scientific application of the principle of mechanics. Do our schools prepare students to grasp the fundamentals of these complicated processes? Unquestionably it is their duty to do this.

How often do we see beautiful results obtained in crown and bridge work, and yet find that they are impracticable because of structural defects—failure to provide for strain, etc. The mechanics of physics finds a prominent place as a subject of study in this department of dentistry.

The dental practitioner should have a comprehensive knowledge of the physical properties of all metals and alloys of the metals used in their work, otherwise he is unable to select the materials most suited to peculiar conditions. It might be feasible to establish a testing department at the dental college, where materials to be used in dental operations might be subjected to tests to determine their power to withstand strain, as in the case of iridio-platinum and other alloys, the tendency of amalgam alloys to change shape on setting, the porosity of cements, etc.

Every dentist uses cements. All are forced to accept the statement of the manufacturers as to their good qualities and to wait the test of time. This is not a desirable condition of affairs, because the cement may have been used extensively before the defects become known. Is it not possible to test these cements so as to determine their properties of density, hydraulicity, constancy of volume, etc.? This is just the sort of work for the department of physics. So soon as we begin to train our students along lines of scientific investigation the manufacturers of

dental cements and other commodities will cease to claim for their products such qualities as "strong," "tough," "more adhesive," "hard," etc.—all indeterminable and meaningless qualities as viewed from a scientific standpoint.

Dental casting processes are many and varied. Good results in this important branch of dental operations can only be obtained by close observation of the physical laws governing the process. Steam and air pressure, centrifugal forces, fusibility and fluidity of metals, the stability and porosity of investing materials—all these must be considered before satisfactory results can be secured. This department of dentistry will well repay the investigator.

The chief aim in any course of physics should be to encourage the student in conducting experiments on his own initiative. If he becomes accustomed to do this before graduating he is sure to make use of his opportunities after entering upon active practice. Much benefit will accrue to himself and the profession at large.

Ontario Dental Convention

THE Annual Convention of the Ontario Dental Society will be held in the Dental College Building, Toronto, May 10th, 11th and 12th, 1915. The Programme Committee has the following programme to offer:

Dr. W. E. Harper, Chicago.....Amalgams

Dr. J. R. Callahan, Cincinnati.....

.....Treatment and Filling of Root Canals

Dr. J. A. Bothwell, Toronto..Treatment of Children's Teeth

Dr. E. W. Paul, Toronto.....Painless Dentistry

Some of the essays will be illustrated by lantern views and by clinical demonstrations. Dr. Harper has requested that members of the Society bring about thirty grains of the alloy which they use, as he hopes to be able to impart to them some useful knowledge regarding the manipulation of each particular alloy.

Arrangements are in progress for a series of clinics of a very superior order. The exhibits of the dental dealers and manufacturers are expected to excel all previous efforts.

Reduced rates on the railroads have been secured on the same basis as existed in previous years.

Mark the dates in your appointment book now.

Toronto Dental Society

TREASURER'S STATEMENT, SEASON 1914-15.

RECEIPTS.

1914.

Oct. 17—Balance from last season	\$101.35
145 Membership Fees	725.00
Visitors' Fees	28.00
Bank Interest	1.47
	<hr/>
	\$855.82

EXPENDITURES.

Essayists' expenses and Hotel Carls Rite for five meetings	\$502.45
Printing	57.00
Postage and Typewriting	29.47
Chas. Potter, Lantern Rentals	12.00
Bell Piano Co.	5.00
Lantern and Screen purchased	28.85
Floral Wreaths	24.00
Cash Balance in Bank	197.05
	<hr/>
	\$855.82

J. E. RHIND, *Treasurer.*

We certify the above statement is in accordance with the books of the Toronto Dental Society, as audited by us this day, March 22nd, 1915.

B. F. NICHOLS,
F. N. BADGLEY,

Auditors.

The Military Dental Clinic at Toronto

THE Secretary of the Committee of Toronto Dentists assisting with the dental clinic at the Exhibition wishes to thank the members of the profession for the courteous and agreeable manner in which he was encouraged in his work. The ready response of the men in taking their part of the work and going to the Exhibition (frequently on short notice) is much appreciated, and made the work of keeping the schedule running a real pleasure.

The following dentists have sent the cheques received from the military authorities for services at the dental

clinic to the Committee, and the Secretary desires to acknowledge herewith the receipt of the cheques received to date:

1, F. C. Husband; 2, W. E. Cummer; 3, H. E. Eaton; 4, T. W. Dawson; 5, John F. Ross; 6, Chas. G. Scott; 7, W. A. Black; 8, Wallace Seccombe; 9, F. J. Capon; 10, J. E. Rhind; 11, E. F. Arnold; 12, W. C. Trotter; 13, Geo. G. Jordan; 14, T. N. McGill; 15, E. L. Gausby; 16, W. J. Woods; 17, C. V. Snelgrove; 18, M. Kates; 19, W. A. Scott; 20, T. Currie; 21, C. F. Colter; 22, W. F. Roper; 23, E. A. Adams; 24, W. T. Willard; 25, S. T. Floyd; 26, F. D. Price; 27, C. E. Sutton; 28, J. J. Loftus; 29, E. Paul; 30, J. W. Coram; 31, J. A. Slade; 32, P. C. Smith; 33, H. A. Hoskin; 34, H. H. Armstrong; 35, A. J. Broughton; 36, G. Wilson; 37, K. Peaker; 38, E. J. Hambly; 39, H. E. Watson; 40, T. E. C. Butler; 41, F. N. Badgley; 42, K. M. McVey; 43, A. E. Webster; 44, S. B. Gray; 45, H. Clark; 46, L. F. Kruger; 47, F. W. Howe; 48, L. G. Smith; 49, Robt. Haslitt; 50, J. S. Chamber; 51, C. O. Fallis; 52, F. J. Adams; 53, D. Baird; 54, C. E. Pearson; 55, C. E. Brooks; 56, W. A. Dalrymple; 57, R. D. Thornton; 58, H. W. Anderson; 59, G. A. Richardson.

C. ANGUS KENNEDY, *Secretary Committee.*

Dentistry One Hundred Years Ago

ADVERTISEMENT APPEARING IN THE TIMES, LONDON,
NOVEMBER 28, 1811.

ARTIFICIAL TEETH, with enamel, which do not change, skillfully fixed without the least pain, from one to a whole set, so as to be worn with or without tying, and are not distinguishable from nature. Natural Teeth placed, from a single to a complete set, on reasonable terms. Has an easy method of fixing teeth firm to stumps, if the stump be ever so decayed; regulates uneven teeth, removes decayed spots to prevent further decay. Teeth cleansed from tartar. Mr. Prince, dentist, attends from ten till four at his house, 9 John Street, Oxford Street. Observe his house is between a coachmaker's and grocer's, as the numbers are irregular in John Street. Prince's Paste Pearls, for concealing decayed or blemished teeth in front. Persons losing a front tooth may, with ease, in a few minutes, substitute a tooth themselves. Half a guinea a box; directions enclosed.

CORRESPONDENCE

Extract of Letters of Captain (Dr.) Chas. A. Corrigan from the Front

France, March 4th, 1915.

OUR days on this job are not divided into eight hours work, eight hours play and eight hours sleep; it is a case of when required, day or night. Have been having it easier since coming to France. The weather has been better and, of course, the work much more interesting. Result is, I never felt better, eat like a horse and sleep well.

After a week in our first billet our brigade (2nd) was moved up to the firing line. We marched from twelve to sixteen miles—a trying march too on the dismounted men, as it was mostly on a rough cobblestone road, which used up their feet. We were attached for a week's training to the (x)th Division, one of the best in the army, and one which stood the brunt of the work in the retreat from Mons. Our brigade staff worked with the (x)th brigade staff. Our infantry with theirs; engineers, field ambulance, etc., the same. Our company was billeted in a town of about 4,000, where their divisional train was located, and they did everything they could to teach us the wrinkles of the game, and incidentally to make life pleasant while we were there. It certainly was a pleasure to meet such men, real English gentlemen and soldiers. The colonel was particularly nice to me, invited me to dinner and on several occasions to his room to have a chat. From what we heard that retreat will certainly go down in history. While there our company looked after our own brigade, and nearly every day in getting up the supplies one or more of our convoys would be under shell fire. The Germans are informed (per aeroplane) about when our convoys move, and as they have the range of the main roads they shell them regularly in hopes of getting us. Last Saturday particularly I was under exceptionally heavy fire. Just before we approached the most dangerous place in the route, a corner in a small village where stood a church (the churches with their spires, etc., are good targets) a battery of our guns hidden behind a

hedge sent a dozen or two over. This, of course, drew their fire, and soon things were lively around our convoy. You would hear a faint boom in the distance, then a wicked whistling sound as the projectile came through the air, and instinctively you would crawl a little further into your underwear until you would see where she would light. None came nearer than about 75 yards, but that is close enough to a big shell when she explodes.

In many respects it is a most remarkable war. In places here the trenches are not more than 50 yards apart. Along all the roads you see bodies of men going to take their turn in the trenches, and they look more like a lot of miners going to work, slouching along in the mud with rifle and spade slung over their shoulder. But one of the strangest features is the fact that they allow the inhabitants to continue to live in these villages which are being continually shelled. For instance, after we rounded safely the corner by the church, one landed just ahead of me, tore away the gate and sidewalk of a kind of a small convent about 25 yards back from the road. Immediately after I was surprised to see the white and anxious faces of two nuns appear at the door. Across the road a door opened and a girl of about sixteen and two or three kids looked out. In the room in which I sit three of the windows are smashed from a shell which dropped in the street a week ago, killing two men and four horses and wounding two men. Yet most of the natives are still here. The country is so thickly populated, I suppose, it is too big a problem to move them.

After a week in our second billet we moved last Monday to this one. As usual on moving day the weather man was most vindictive, but he served up a unique and original kind for our discomfort this time. Heavy black clouds rolled up, it became dark as night, along came a wind which could be truthfully classified as a small-sized cyclone, and accompanied, instead of rain as we expected, by wet, sticky snow. It did not last very long, but quite long enough to thoroughly wet and chill everyone. I had orders to meet the brigade at a certain cross road, and as each brigade passed hand over its supply wagons filled. Orders were changed, three units branched off before reaching me, and without notifying me went serenely on to their billet. It took me till 1 a.m. next morning to locate them. Next day I read the Riot Act at brigade headquarters.

At Salisbury all winter the work was most hard, discouraging and depressing, but out here weather is better.

We feel we are doing something at last. Am in the saddle a lot. The work itself is stimulating, and it is great. I wish you could share it—you would like it. Of course just now we are picnicing compared with what is ahead when the advance begins.

The work of the A. S. C. has been one of the wonders of the war. This can be attributed largely to the use of mechanical transports, which can bring supplies, etc., comparatively close to us.

I could go on indefinitely, but must stop. The letters are all censored, which prevents me giving more definite locations, etc. I am censor for this company, which, of course, does not alter the case. The other day I censored a letter from a young lieutenant to his mother in Victoria, B.C. The evening I did so word came in that he was killed that day.

You probably know much more than I of what the division is doing; number of casualties, etc. Our interests are localized and we get little outside or even surrounding news.

March 9th, 1915.

Everything here O.K. so far. We are in a village about four miles behind the trenches, so pretty safe and quite comfortable. March is usually the wet month here, but so far, compared with Salisbury, has been fine; that is to say if it only rains about every third day we are well satisfied.

Had a rather close shave yesterday. Rode to brigade headquarters in a small village about four miles away. When about 100 yards from headquarters they started to shell the place savagely. I took shelter in lee of a wall for half an hour and watched them tear into houses, etc., around, some striking 25 yards away. One will never forget the wicked sound of the shell as it comes through the air. It is fascinating work too watching shell fire. After it ceased a little I crossed an open space of about 100 yards to headquarters building, and when just at the corner of the building, hearing one coming, I stopped and hugged the wall. It carried away part of the roof, pieces of brick and slate falling on me, and then exploded in the roadway. I stepped around the corner and was surprised to see, not six feet away, two men of the Seventh badly wounded. We carried them into headquarters, where one died in a few minutes. The other had his leg torn, but is not dangerously wounded. I'm going to keep away from there in future, as I intend to run no unnecessary risk.

C. A. CORRIGAN.

MULTUM IN PARVO

This Department is Edited by C. A. KENNEDY, D. D. S., 2 College St., Toronto

Librarian, Royal College of Dental Surgeons of Ontario

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS
OF THE PROFESSION, WILL BE GREATLY APPRECIATED BY THIS DEPARTMENT

THE Dr. Willmott's amalgam-carrier spoon is the best instrument for pushing up a ligature towards the gum on the lingual aspect of a tooth.—*C. G. Scott.*

RECEDING GUMS.—Glycerit of tannin, made by dissolving 1 oz. of tannic acid in 4 oz. of glycerine by gentle heating, is applied to spongy or debilitated gums as a tonic astringent lotion. It condenses the soft gums and re-establishes the nutritive functions.—*Dental Surgeon.*

DISSOLVING PLASTER FROM A VULCANITE PLATE.—The last traces of plaster can be entirely removed from a plate by placing it in a solution of hydrochloric acid two parts and water one part for five minutes. The plate is then cleansed with a stiff brush.—*Australian Journal of Dentistry.*

TINCTURE OF BENZOIN.—If from any cause the alveolar process has been exposed, pain can be instantly relieved by covering the exposure with a pellet of cotton saturated with tincture of benzoin. The application is also valuable in relieving the painful eruption of third molars.—*Dental Surgeon.*

TESTING THE VITALITY OF PULP OF TEETH.—One dry cell battery attached to vibrator, platinum needle in thermo-cautery needle holder forming one pole and the other in patient's hand. Touch suspected tooth with platinum needle. If vital, electric shock. If devitalized, no reflex.—*C. D. Lucas, Dental Summary.*

AN ADJUNCT IN PRESSURE ANESTHESIA.—Sometimes, when attempting to extirpate pulps under cocaine pressure

anesthesia, the pulps remain sensitive, as in idiosyncratic cases. I find that 95 per cent. alcohol instead of cocaine acts immediately in producing the desired anesthesia in such cases.—*A. S. Cambage, Commonwealth Dental Review.*

VASELINE STOPPERS OF MEDICINE BOTTLES.—The glass stoppers of medicine bottles may be prevented from sticking by the application of a thin coat of vaseline to each stopper.—*C. A. Halle, Dental Review.*

NOVOCAINE AND SUPRARENAL EXTRACT.—The addition of suprarenal extract to the novocaine solution. Klapp, Braun, and others have shown that suprarenal extract greatly retards its absorption, enhances the anesthetic by prolonging its action and, as it intensifies the anesthesia, much weaker solutions can be used; furthermore, it produces a more or less bloodless field. Too much suprarenal extract, however, should not be used, as symptoms such as feelings of oppression, palpitation and increase in pulse rate, rapid and deep breathing, may be caused by it. These, however, are evanescent and not serious, as its injection beneath the skin does not raise blood pressure, as it does when it is injected into a vein, and follows the injection of 1/2 cc. or more—*Herbert A. Potts, Dental Review.*

INDICATIONS FOR PULP CAPPING.—Pulp capping has quite generally been tabooed of late years by the profession, and yet in certain well-defined cases it is the best possible practice. Pulp capping is indicated in the following cases: When the tooth has given little history of pain, and when the pulp has been only slightly exposed by instrumentation without being infected or subjected to infection by being bathed in the fluids of the mouth; in cases of young patients where we are not certain that the apical ends of the roots are completely formed; and in those cases of adults where there is any promise of saving the pulp in teeth the cavities of which are so located that it is difficult to reach the canals and properly treat and fill them, without grinding or drilling away most of the crown. We may not always succeed in saving the pulp by capping, but we should at least try in the cases indicated, and we should have a frank understanding with the patient as to the possibility that we may fail.—*C. N. Johnson, Dental Review.*

ORAL HEALTH

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A Monthly Journal devoted to the furtherance of individual and community health by the advancement of Dental Science and Oral Hygiene.

Published in the hope that it may reach those with an open mind, a willing heart and a ready hand to serve.

SUBSCRIPTION PRICE - \$1.00 PER YEAR.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, 229 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to the Publishers, Oral Health, 229 College St., Toronto, Canada.

Vol. 5

TORONTO, APRIL, 1915

No. 4

EDITORIAL

Toronto School Dental Clinics

THE Editor has accepted the position of Chief Dental Inspector of Toronto Public Schools. This appointment was made by the Board of Education largely upon the recommendation of the Toronto Dental Society, and the writer desires to express to the members of the Society his appreciation of the confidence thus shown. That the appointment was unanimously made shows clearly the attitude of the Board toward the sympathetic interest taken by the dental profession in the work of the school clinics in this city. The writer has undertaken the work because of a keen interest in school dentistry and a firm conviction that school dental clinics render splendid service and are essential to the best development of the rising generation.

Periodical examination of school children's teeth, either by the school or family dentist, is of itself a great advantage and is being more and more highly appreciated by the parents of poor and rich alike.

Of still greater advantage is the presence in the schools of thirteen Toronto dentists, for half of each school day, devoting themselves to free dental work for pupils whose parents are unable to pay for dental service in the regular way.

In addition to periodical examination of the teeth and free dental work for the poorer children, it is essential that ample and frequent instruction be given the children in preventive treatment. The duty of the daily care of the teeth should be imposed upon each scholar and the importance of a clean mouth and its relationship to good health duly impressed. Such a programme calls for the most active and sympathetic co-operation by the dentist, teacher and parent.

Dentists in private practice sometimes find it impossible to secure the proper daily care of the teeth, particularly of their younger patients. This may, however, be accomplished more easily through the school than through the home. The child meets the teacher under conditions of discipline frequently lacking in the home, and the habit of the daily care of the mouth may more easily be insisted upon.

There must too be the most active co-operation and sympathy between the family dentist and the school dentist. It is most gratifying to know that wherever school dental clinics have been established they have always received the most active and loyal support of the entire dental profession. This indicates a spirit of progress that is most commendable.

Emetine Treatment of Pyorrhoea

ELSEWHERE in this issue will be found an excellent article, "A Review of Recent Studies Upon Amoebic Pyorrhoea," read before the Toronto Dental Society by Dr. M. T. Barrett of Philadelphia. Drs. Barrett and Smith deserve great credit for their original work in connection with the use of Emetine in the treatment of pyorrhoea alveolaris. This paper should be carefully read and studied by the dental profession.

Unfortunately there are those who have followed Dr. Barrett, but are less conservative than he and have adopted a most extravagant attitude both in their use of Emetine and in their claims for its efficacy. Some of the illustrated weekly papers have now announced that Emetine treatment is one of the great discoveries of the ages and a perfect

cure-all for the "loosening of teeth." These claims may or may not be true, but until they are established scientifically it would be well for the profession to go slow and adopt a policy of "watchful waiting."

Emetine is recommended by some for local application, by others for subcutaneous injection, and yet by others to be swallowed in the form of tablets. In this latter case a compound of ipecac alkaloids with hydrated aluminum silicate has been suggested as producing no nausea. The drug in this form, it is claimed, passes through the secretions of the stomach unchanged, but the alkaloids are liberated in the presence of the intestinal fluids.

Until the value of Emetine and the best method for its use are absolutely established by experimental test and clinical experience, it would seem to be best for the dental profession to confine itself to the local application of Emetine. ORAL HEALTH will be glad to receive for publication clinical results of pyorrhoea cases treated with this drug by members of the profession.

ORAL HEALTH extends congratulations to Dr. Harris of Southampton upon his recent marriage.

Obituary

D R. W. A. CROWE, of Chesley, Ontario, died very suddenly 23rd March, 1915.

Oral Hygiene Reports

Salt Lake City, Utah.—There is a movement on foot in this state that the Board of Dental Examiners be given authority to supervise all dental work done at the state prison, the state mental hospital and the state industrial school.

It is recommended that the State Board of Dental Examiners be given authority to employ a competent dentist, or dentists, to give treatment to inmates of these three institutions and such other institutions as the legislature may direct.

This movement is a result of the recognition of the relationship between incorrigibility and moral degeneracy and the neglect of the teeth. The health is also impaired and various diseases frequently result.

A ROSE FOR THE LIVING.

IF Major-General Hughes went on active service and fell on the field, there are none who would withhold the tribute they owe him. What they owe him then they owe him equally to-day, for a necessary and worthy service, that has been adequately and heartily rendered. A rose to the living is more than a wreath to the dead.

"Every man to his place and according to his ability" is a standard by which Major-General Hughes can be judged and honored. He has done the duty asked of him in a way that has given satisfaction to all who are responsible for having the duty performed. The men who have gone to the field under his organization have had no complaint about the result of his plans. What was to be done has been done effectively, and it continues to be done.

Sam Hughes is a good soldier and a brave man. He is an excellent organizer, and he got the biggest expeditionary force ever carried across the sea over to Europe without a hitch. As many more are ready to go and will go, and more after them.—
Editorial, Toronto World.



MAJOR GENERAL SAM HUGHES

The Honorable the Minister of Militia and Defence,
Canada.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 5.

TORONTO, MAY, 1915

No. 5

Organization of New Dental Corps, Canadian Militia

ORDERS have been issued for the provision of dental services for the Canadian Expeditionary Force, as follows:—

ORDER NO. 162.—CANADIAN EXPEDITIONARY FORCE.—DENTAL SERVICES.

Where practical, steps are to be taken to have the teeth of all officers, non-commissioned officers, and men of the Expeditionary Force examined and put in proper condition to the extent of all extractions and amalgam fillings before the Contingents leave Canada for overseas service, and temporary appointments should be made for this service as occasion requires.

To ensure that the mens teeth are kept in proper condition during the period of the war, the following details are authorized for employment on this service:—

One Officer in charge of all Dental Surgeons, to be attached to Divisional Headquarters and to be under the direction of the Officer Commanding the Division. This officer will be designated as "Chief Dental Surgeon."

One Dental Surgeon for each brigade of mounted rifles and artillery (including Divisional Ammunition Column).

Two Dental Surgeons for each brigade of infantry.

These officers to be attached to the Brigade Headquarters.

One Dental Surgeon for each field ambulance, stationary and general hospital, and

One Dental Surgeon for the base hospital for medical stores to take charge of stores and equipment.

One Dental Surgeon for units not otherwise provided for, to be attached to Divisional Headquarters and under directions of Chief Dental Surgeon.

Each Dental Surgeon to be entitled to two men, one to act as orderly and one man as servant or groom.

The foregoing order applies only to the Expeditionary Forces, but it is the expressed intention of the Minister of Militia to complete the organization throughout the entire militia. Dr. J. Alexander Armstrong of Ottawa has been appointed Chief Officer in charge of Dental Services, and the following plan has been worked out as a suggested establishment for the Canadian Army Dental Corps:—

ESTABLISHMENT FOR PROPOSED CANADIAN ARMY DENTAL CORPS.

For Each Division.	Officers.	Orderlies.	Batmen.	Total Personnel.	Horses.
1 Chief Officer in charge Dental Services	1	1	1	3	1
Dental Surgeons, 2 per each Infantry Brigade.	6	6	6	18	
Dental Surgeons, 1 per each Artillery Brigade and Ammunition Column	4	4	4	12	4
Dental Surgeons, 1 per each Field Ambulance.	3	3	3	9	
Dental Surgeons, 1 for other Units of Division.	1	1	1	3	
Total for Division	15	15	15	45	5
Dental Surgeons, for each Brigade of Mounted Rifles	1	1	1	3	1
Dental Surgeons, for each Field Hospital	1	1	1	3	
Dental Surgeons, for each Base Hospital	1	1	1	3	
Dental Surgeons, for each Base Stores	1	1	1	3	
Total personnel required for Division, with Brigade of Mounted Rifles, Stationary and Base Hospitals and Base Stores ..	19	19	19	57	6

RANKS FOR OFFICERS OF DENTAL CORPS.

The Chief Officer in Charge to have rank of Lieutenant-Colonel.

The Senior Officer with each Division to have rank of Major.

Officers with Field Ambulances and Hospitals to have rank of Captain.

Remainder of Officers of the Corps to be Lieutenants.

The Orderlies to be Sergeants and Corporals, in accordance with qualifications and service.

It is suggested that the Dental Corps be put in with the Headquarters Unit of Division and Brigades, as it is thought this would help out in matters of transport.



Captain J. Alex. Armstrong, Ottawa

CAPT. J. ALEX. ARMSTRONG has been for a number of years prominently identified with military activities in the Capital, and the rifle-shooting branch of the work. He first joined the Governor-General's Foot Guards in August, 1884, serving in the ranks. He was connected with this regiment until 1887. In 1892 he joined the 43rd Regiment, and in 1898 took out a commission. He was promoted to the captaincy in 1904, and remained in that capacity as commander of Number 8 Company of the regiment

until on his application in 1910 he was transferred to the corps reserve of officers.

In 1908 he was elected chairman of the 43rd Regimental Rifle Association, which position he still occupies. After being transferred to the reserve, which relieved him of the duties of company commander, he was able to devote all the more time to rifle shooting. He has been an energetic and capable officer, in addition to being one of the leading dentists of the City of Ottawa.

New Dental Regulations British War Office

THE British War Office on January 22nd issued to the various commands a circular letter, and reproduced in the Dental Review, in which important decisions relating to the dental treatment of the troops were announced.

During the war, all dental treatment necessary to render a non-commissioned officer, or man fit for service in the field, will be afforded, including the provision of such artificial dentures as may be considered necessary for efficient mastication. The existing limit of one pound (£1) per man may be exceeded in cases where the work necessitates a higher expenditure, provided that in no case is the expenditure to exceed three pounds (£3) per soldier treated without the special authority of the general officer commanding-in-chief. Where available dentists attached to military hospitals will be employed to the fullest extent. For the supply of maximum cost, having regard to the class of work required: (a) Complete upper or lower denture, from £2 to £3; (b) complete upper and lower dentures, from £4 to £6; (c) partial upper or lower denture, comprising not more than five teeth, about £1 10s., or possibly a little higher.

It may be presumed that the work may be undertaken by practitioners in their private practices, in any district where the commanding officer or his medical adviser deems such an arrangement to be expedient.

Dentistry in the British Army

MUCH official interest has been shown in Great Britain regarding the dental needs of the Army. Questions are constantly being asked in Parliament regarding the progress of measures for giving dental service to recruits and to the men at the front. The following two questions and their answers are typical of many British parliamentary inquiries since the commencement of the war. The British Government has more recently shown a keen appreciation of the importance of this matter, and is evidently ready to make a much-needed reform in this direction. The advanced position of the Canadian Government in regard to the organization of a Canadian Dental Corps will undoubtedly assist materially in having dentists and dentistry recognized in the militia of other countries, as their importance deserves.

PARLIAMENTARY QUESTION RE DENTAL TREATMENT FOR RECRUITS.

Sir William Bull asked the Under Secretary for War whether an official intimation had reached Nottingham that the War Office had sanctioned a change regarding recruits and defective teeth; whether men would now be allowed to be attested if otherwise fit and subject to their consenting to undergo dental treatment; and if so, whether it was proposed to extend such official orders to other recruiting centres?

Mr. Tennant (in a written answer) replied: Instructions have been issued to all commands that recruits found physically fit in every respect except on account of insufficient teeth may be passed by a medical examiner of recruits as "fit, subject to dental treatment." Such men, if willing to undergo dental treatment, may be attested and despatched to the depot, final approval being deferred until they are pronounced to be in all respects fit. The necessary dental treatment will be carried out as soon as possible after the men's arrival at the depot.

PARLIAMENTARY QUESTION RE DENTISTS AT THE FRONT.

Sir Clement Kinlock-Cooke asked the Under Secretary for War whether he was aware that dentists were attached to the New Zealand Expeditionary Force, and would he consider the possibility of attaching dentists to the different units of the new army?

Mr. Tennant wrote in reply: "Yes, I am aware that dentists are attached to the New Zealand Expeditionary Force. Dentists and dental mechanics, with full outfits, instruments, apparatus, and material, were some months ago supplied to the British Expeditionary Force. Dentists have already been appointed at the large stations in the United Kingdom, and more appointments will be made, if required, as soon as the instruments, etc., are available from the manufacturers."

Appointment of Dentists to the Army in Australia

AFTER many years of hard struggling and forcible representations by official bodies and by dental societies, the Government of Australia has at last decided to appoint duly-qualified dental surgeons to the military forces of the Commonwealth, with the definite rank of lieutenant, and the rank of captain for the senior dentist. It might very well be asked why this necessary action has taken so long to bring about. There are some minor reasons, but the chief one is that there has been a spirit of antagonism, in certain quarters, against the dental profession. The recognition had to come eventually, seeing the great strides dentistry has made during the past few years and the thorough training which the up-to-date dental student now receives in the relation of medicine to dentistry. That training the medical student has not so far received, and hence, as we have hitherto pointed out, the medical practitioner finds himself at a considerable disadvantage in the diagnosis of certain constitutional disorders arising from defective teeth.

The war has done a great deal towards making those in authority understand the value of good teeth. Almost every British medical or dental journal that one picks up contains references of some kind to the sufferings of the soldiers due to defective masticating organs. In the most recent issue of the "British Medical Journal" the subject is again mentioned. In reporting therein on the condition of the men in the hospital at Brighton, a contributor says: "There are many cases in the hospital at the present moment invalided home simply on account of dental caries, or for the want of artificial teeth properly to masticate their food."

The medical profession is gradually acquiring a more complete knowledge of the great value of good dentistry to the public; still, the stage has hardly yet been reached when the appointment of dentists to any branch of the public service should be left in the control of any particular members of that body. It appears that these new dental appointments to the A.A.M.C. are to be made by the medical officers. Without intention of casting the slightest slur on the professional knowledge of any medical man, we say that, however highly qualified he may be in his own special work, he is not competent—by reason of the different course of training he has received—to select dentists for army purposes. The selection should be made by dental surgeons of undoubted standing and ability, men specially appointed for the purpose, who do not seek the military positions themselves, who have no axe to grind, and who may be depended upon to choose those applicants best suited on all counts. The Minister for Defence has done a real service in deciding that these appointments be made. We trust that he may be induced to carry the matter to its logical conclusion by seeing that the choice of candidates is placed in the hands of those who, in the natural order of things, are the most competent to judge—the dentists.—*Editorial, The Commonwealth Dental Review.*

Dentists' War Relief Fund

A GENEROUS response has, according to the British Journal of Dental Science, been made to the appeal issued by the British Dental Association on behalf of the Dentists' War Relief Fund, and already over £1,000 has been subscribed.

The committee of the Association's Benevolent Fund, under the Chairmanship of Mr. C. Robbins, has undertaken the administration of the Fund, and every care is being exercised in the economical and judicious management of it, careful but sympathetic inquiries being made in all cases. One of the main objects of the Committee is to keep families and homes together, and when possible to assist in the education of children. Assistance is already being given to both British and Belgian dentists: in the case of several Belgian dentists, allowances have been made for clothing

Royal Naval Reserve Dental Surgeons

THE Dental Record announces that at a meeting of the Privy Council on the 2nd March approval was given to a memorial of the Lords Commissioners of the Admiralty for the establishment temporarily of the rank of Royal Naval Volunteer Reserve Officer, to be entitled Dental Surgeon.

The relative rank of such officers will be that of Surgeon R.N.V.R., and the pay will be at the rate of £2 a day. Compensation for injury and pensions and allowances to widows, children, etc., will be on the same scale, and payable under the same conditions, as those applicable to Surgeons R.N.V.R.

Dental Clinic for Public Schools of London, Ont.

A COMMITTEE representing the Board of Education of London, Ontario, visited Toronto recently and made extensive inquiries concerning Dental Inspection in Toronto Public Schools. The committee expressed the hope that London would soon have dental clinics in the Public Schools.

Analgesia and Ethylchloride

ETHYL-CHLORIDE, according to numerous observers, is much safer than mixed anesthetics such as Somnoform and Bruggs mixture. In common with these it should be administered by the open method. Several loose layers of gauze are placed over the mouth and nose of the patient and the anesthetic is allowed to drop rather slowly (10 to 20 drops in 10 seconds), or an average 20 to 40 drops for children and women, and 40 to 80 drops for men, are usually required to produce analgesia sufficient for minor surgery. Smaller doses will be sufficient for excavation of cavities. The analgesia lasts as long as that produced by the mixtures. It may also be used for producing mandibular anesthesia by local spraying of the dried mucous membrane over the inner surface of the ramus.—C. H. Clarkson, D.D.S., Toronto.

Buffalo Letter

THE RESURRECTION OF HABEC.

HABEC has revived! The glorious spring sun has penetrated the innermost recesses of his corporosity and once again has given his haemotagenic fluid an impetus that has sent it bounding through the myriads of subways and tubes of his circulatory outfit. From the Grand Central Station it gurgles joyously to the Bronx, to the Battery, and from the East River to the North, until the spirit of the season pervades every atom of junk that is commonly labeled "a human being."

Facts of the case are that Habec stuck his head out on Candlemas Day, saw old Bruin's shadow, and was so severely frightened that he has been unable to squeeze anything out of his think emporium since. Had it not been for the receipt of Wallace's small sample of well-organized rhetoric which conveyed a handsomely-gowned but none the less emphatic protest against Habec's clam-like demeanor, it is doubtful if the subscribers to ORAL HEALTH would have been made the innocent victims of this deep-dyed conspiracy. But it reminds Habec that there are several little things that have gone wrong of late and seem to need the regulating and pacific influence of his stupendous brain-force, hence he craves your indulgence in the apparent assumption in that which follows:

IT IS TIME!

Yes, it is time we began to give serious consideration to the subject of pyorrhea as it is being treated by the public as well as by many of the members of the profession. The "horrors" of this "terrible scourge" are being openly flaunted before the public and the credulous are lapping it up with startling avidity. Something is radically wrong, and it is high time that we find out who is to blame. We are driving multitudes of people with healthy mouths into the hands of the empiric and the quack. The field is even so fruitful that many medical men see the "hand-writing on the wall" and are finding the amoeba in the mouth of nearly every case examined. A new physician in a near-by city is making himself known throughout his vicinity in this way, and is asking honest dentists to use emetine hydrochloride in mouths absolutely free from pyorrhea.

Perhaps the physician in question may be entirely innocent of wrong-doing and is only following his natural bent, for he sports the significant name of "Bugbee." Possibly he is more to be pitied than censured, but we wish he'd mind his own business, just the same. Another instance which is taking place in Buffalo at the present time is being acted out at the Gratwick Laboratory, a State institution for cancer research work. One of the staff has a severe attack of "amoebafobia" and is injecting emetine into the arms of every victim in sight and is making some "wonderful cures" of pyorrhea. Six of our eminent physicians are wearing sore arms because of their devotion to science. By way of introducing the conversational element into this profound dissertation, Habec appends a short dialogue between a patient and himself, which patient is a nurse at the before-mentioned relief station:—Habec: "I understand emetine hydrochloride is being used by one of your staff for the treatment of pyorrhea?" She: "Oh, yes! It is! Dr. Stickum is using it on me." Habec: "Ah! Oh! Huh! Well, what is he using it for, may I ask?" She: "Pyorrhea." Habec: "Who told you that you have pyorrhea?" She: "Why, Dr. Stickum!" Habec: "Will you kindly present my compliments to Dr. Stickum and say to him that you have pyorrhea no more than my great toe has." In fact, there was not even an initial point of gingivitis that Habec could discern. Only this day, in speaking to this patient about the progress of the "scientific research," she remarked that the learned scion of science had examined the case and agreed that the mouth looked very much better. Perhaps he did not assume all the credit after the young lady said, "It should look better, for I have just finished having considerable dentistry done!" It is easy to gather from the foregoing that if the learned doctor really knew what pyorrhea is he might be better qualified to treat it, but in lieu of such knowledge he might condescend to submit to the indignity of having a plain, ordinary dentist person confer with him to determine its presence. Almost human intelligence has, betimes, been displayed by members of our cult. But, don't you savey? If Dr. Johns Hopkins Stickum should awaken a great and marvelous somnolent truth, to him alone would be the glory and to the State of New York would be the honor of supplying the emetine. It has been a source of wonderment to him "why dentists do not use it more." We could tell him, but we believe in using our conversation to better advantage.

However, a few words on the subject might not go amiss here.

Many members of the medical profession have grasped this straw and are using this treatment promiscuously and without apparent conception of the etiological causes of the condition. It is surprising, too, that a fair percentage of them belong to the better class of practitioners. There have been some very amusing incidents and rather ludicrous situations that has given us a chance to laugh at them. They are, as a class, ignoring our rights in this field, and think that we are either not competent to apply emetine or that we are ignorant of its action. We do not hesitate to say, however, that there have been many examples of the all-powerful influence of a good fee as the motive. Perhaps this statement should not be made, but it is not meant for the honorable physician of whom, we are happy to say, the medical profession is largely composed, but if the shoes fit, put them on and wear them home.

The situation at present is deplorable, and the mind of the credulous public has been inflamed by newspaper and magazine articles which have heralded the discovery as a specific. All this might have been avoided if our profession was safeguarded by laboratories for scientific research that were not connected with manufacturing drug houses. It is said these concerns are likely to reap a harvest of several millions from this source. Such institutions as the new Evans Institute in Philadelphia, the Forsyth Laboratories in Boston, as well as some others, will rescue us from such quagmires. Each dental school should have such a department upon which its alumni might depend to work out all such problems and thus help him to safeguard his patients. We have established such a department in the University of Buffalo Dental School, and it is in charge of competent medical and dental men. Their findings thus far regarding emetine have been of value, but not especially favorable. Habec has for several months been testing it for Park Davis Company in his practice and has been unable to report but slight benefit thus far. Used without instrumentation the effect is rarely apparent, and when used after instrumentation it is difficult to determine its value. The final verdict will be that it is merely an adjunct of questionable merit, and hence will early join the ranks of the great majority of pyorrhea specifics that blossom but for a day. We are sorry, but that must be its fate.

We are well aware that the use of emetine will do no

harm, except, perhaps, producing an occasional slight nausea, and if it can be proven of but slight value as a corrective agent, it is worth using. But, granting that the amoeba are present in pyorrhea, does it necessarily follow that they are the agents of the destructive process? As Dr. Talbot recently remarked, if emetine destroys the amoeba, what of the other forty-nine bacteria? At the present time Philadelphia has a decided amoeboid movement, which is perfectly natural, because the new treatment was germinated there, and they believe that they are getting some results from its use, but we are willing to gamble that ere long the movement will be on the wane. Whatever of scientific value it may possess will require many more months to determine. If subcutaneous application to the arm should be finally determined as the best method, it is quite likely that but a comparatively small number of dentists will employ it, for, as a class, we are not sufficiently well versed in "needle work" of that kind to take any chances.

THE GRINDSTONE CURE.

We are beginning to realize that common sense is a good general specific, and that it is just as applicable to the treatment of pyorrhea as it is to raising potatoes. When it is applied to a consideration of the direct causation of so-called pyorrhea we discover that at least nine-tenths of it is due to a faulty mechanical principle. In other words, the prime irritant in the great majority of instances is mechanical in character, which fact is, of course, well known. A mal-shaped filling; rough cervical margins; calculi and serumal deposits; ill-adapted crowns, bridges or dentures and mal-occlusion resulting from a dozen causes, more or less, are conditions to be reckoned with. Occlusion is the fundamental and all-important principle governing the whole structure of dental conservation, and when we apply to the natural teeth the same consideration and technique that we are applying to the construction of mechanical substitutes, we will prevent and cure more pyorrhea than we will with all the dope in Christendom. Habec would suggest that whenever wrong occlusion is apparent, correct models be secured of each case, mounted on Gysi articulators, and each tooth carefully studied as to forward, lateral and distal contact; all irregularities noted, and then with the merry little grindstone and articulating paper the correction is made in the mouth. Should you attempt this plan you will, doubtless, be surprised at the

number of instances showing the need of correction. Whenever a molar or bicuspid is missing, careful study in this way will reveal wrong contact at several points, and it is but a question of time when the initial lesion of pyorrhea will occur. We all have heard about the little drop of water that punctured the millstone. The same principle applied to the gentle tap, tap, tap of one tooth against another must eventually break down the most resistant tissues. The inclined-plane contact is the most disastrous of all, and should never be allowed to pass uncorrected. These are two main conditions affecting nearly every person; first of all is a natural wearing down of the occlusal surfaces of the molars and bicuspids due to mastication. The other condition is not as prevalent as the foregoing, but it is quite common; namely, a sort of migratory tendency of the anterior teeth, which generally appears after the fortieth summer has faded into an equal number of perennial autumnal reveries. With the fair sex, however, this condition might (apparently) occur some few summers earlier, especially if the faithful application of sage tea had performed its mission. Naturally we expect this to evoke remarks of criticism, for it savors strongly of sarcasm, but it is chronic with Habec, hence, unavoidable. Nevertheless, the facts prove that many teeth get the "movie habit" and refuse to stay at home, in consequence of which they have to be "trimmed," the same as all other unrulies. To dentalize an old saying, it is a case of: "Spare the grindstone, ruin the tooth."

Habec would like to have some of his Canadian friends, who have not already proven the value of this treatment, give it a trial and report the results to ORAL HEALTH. We would particularly like to hear from Dr. Cummer on this subject. We believe that all will agree that occlusion, as considered by our profession to-day, will revolutionize the practice both of operative and mechanical dentistry. We must admit that every new development toward preventive measures in dentistry that has been boiled down to a working basis may be given tentative proportions in the ratio of seventy-five per cent. mechanical to twenty-five per cent. medical.

The great and none-such profession of dentistry of 1950 will have as an operating fundament but one great maxim: CLEANLINESS. From this may radiate a few co-ordinate pedicles absolutely interdependent and co-related, in which the medical representation will sit in the last row in the

gallery. The adoption of the four-year course for the study of dentistry has been exploited as a means of putting us on a par with the medical man, but in reality it is needed to *put us on a par with ourselves*. And now, patient reader, we thank you for your fortitude, and will close with this silent admonition:

Just here and there with gentle touch
The Grindstone Cure apply,
Then some day you, with Dr. Riggs,
Shall dwell up in the sky.

HABEC.

Military Dental Clinic at Toronto

THE Secretary of the Clinic Committee wishes to acknowledge the receipt of cheques from dentists who participated in the work of the clinic since the last report was published:--

61, W. A. Mathieson; 62, A. R. Jordan; 63, N. Pearson, Aurora, Ont.; 64, R. G. McLaughlin; 65, Charleton Mills; 66, A. W. Ellis; 67, N. S. Coyne; 68, F. A. Dayment, Buffalo, N.Y.; 69, C. A. Kennedy; 70, G. L. Spaulding; 71, R. G. McLean; 72, E. A. Doison.

The following is a list of the dentists who participated in the work of the dental clinic after the Government appropriation had been expended and who did not receive any remuneration for their services:---

G. F. Beldon, W. C. Smith, M. J. Sisley, H. M. Kahbfleisch, F. H. Jones, C. P. Sherman, W. R. Marshall, B. O. Fife, Arthur Day, J. H. Ante, W. E. Willmott, A. D. A. Mason, J. A. Bothwell, E. A. Wessels, R. W. Emmerson, H. M. Peaker, J. F. Conboy, H. D. Crooker, M. L. Laidlaw, M. A. Fallis, O. W. Canning, A. B. Wagg, W. S. Madill, T. H. Henderson, Alex. Elliott, A. M. Philips, R. J. McGahey, W. J. Woods, W. G. Trelford, J. F. McMillan, J. H. Carrique, W. C. Wickett, C. C. McDonald, M. W. Rutherford, Thos. Cowling, Mr. Boyle, Mr. McCarten, Mr. Walsh.

The Secretary wishes to again thank the dentists for responding so readily to the call for help in this most patriotic cause.

Further receipt of cheques will be duly acknowledged.

Some Practical Suggestions in Prosthesis

BY IRVIN H. ANTE, D.D.S., TORONTO.

THE following are some suggested procedures in laboratory technique. They have all been used by the writer with success and are offered to the profession in the hope that others may find them of value in increasing interest in the laboratory end of dental practice.

Plaster.—I strongly advocate the use of “Made in Canada” goods, but I am sorry to say that it seems almost impossible to get good Canadian plaster. Invariably during the process of vulcanizing the plaster will break down and wash out of the flask, with very disastrous results to the piece of work contained. To remedy this defect it is necessary to let the case stand for one or two hours after flowing, previous to placing it in the vulcanizer; also after vulcanizing do not relieve the pressure in the vulcanizer too quickly. Avoid the use of flasks with large holes.

Most of the plaster dealers keep the barrels of plaster in an old shed exposed to weather conditions. Plaster readily takes up moisture from the air and, as a result, one gets a slow setting plaster. When ordering Canadian plaster again, see that you get a barrel from a fresh stock and keep it in a dry place in the office. French’s model plaster overcomes all of these troubles and is no doubt cheaper in the end.

Investment.—Plaster is used very extensively in the manufacture of investment compounds. The plaster is only used as a bond for the mass. As most of the changes take place in the plaster, only as much is used as is necessary to hold the mass together. Silica being high fusing, and expanding and contracting the least, it is used to fill in the pores of the mass. It also counteracts the changes that take place in the plaster. Silica sand forms centres towards which the shrinkage of the plaster takes place, thus preventing cracking and shrinkage of the mass of material. Coarse pumice serves the same purpose, but causes slight expansion, and also produces porosity.

If any of the gentlemen are interested in making their own investment compounds, try the following for casting inlays, etc. Eight parts, by measure, of plaster, ten of silex, four of silica sand, and two of coarse pumice. Pass through a fine sieve and then mix by shaking all together in a large

paper bag. For a crown and bridge investment compound try, parts by measure of the following; four of plaster, two sand, two Portland cement and three coarse pumice. The use of too much Portland cement will destroy the coloring in some makes of teeth.

Spence's Compound.—This compound will be found very useful in constructing a trial plate out of tin foil. After securing a Spence compound model swage a piece of No. 6 tin foil upon the model, or paint same with a solution of chloroform, rubber and vulcanized alumina, as is recommended by Dr. Spence, to prevent the vulcanite adhering to the Spence model. Now swage two pieces of No. 34 gauge tin foil upon the model with the soft rubber blocks in Ash's press (or others), remove from press and trim the tin to the proper outline, trimming the upper or second piece about one quarter of an inch smaller all around. To produce the rugae, place this second piece upon a plaster or metal cast having well defined rugae and burnish the rugae into the foil. Remove the foil, turn it over and fill the impressions of the rugae with sticky wax; also smear the remaining surface. (A sticky wax can be made of one ounce of resin, half teaspoon of venice turpentine, and half ounce of bees-wax, melted in order given.) While the wax is soft replace on model and press to place with fingers, remove and seal the edges with wax; build upon this tin base your wax biting block and use as a trial plate the same as usual. (Do not forget to remove this tin trial plate when you separate the flask to boil out the wax before packing.) The advantages of the tin trial plate are: (1) Easy to adapt. (2) It does not distort easily. (3) An easy way to produce or reproduce the rugae. (4) It produces a uniform thickness in the arch of the finished denture. (5) Gives good adhesion in the mouth. (6) The adaptation or fit of the plate can be verified. (7) The effect of the metal in the mouth is pleasant. The object of using two pieces of metal instead of one is that two pieces stuck together gives a more rigid base than one. The rugae can be produced in the second or top piece without disturbing the adaptation of the other on the model. Wax can be flown between the two pieces to produce the desired thickness.

Spence's compound will not adhere to linoleum as it does to glass, if the surface of the linoleum be waxed with ordinary floor wax.

Equal parts of Spence's Compound, French plaster, and

fine sand makes an excellent crown and bridge investment compound.

The Tin Finished Vulcanite.—Tin foiling vulcanite dentures is by no means new, but is little used by the profession, most men thinking it too much trouble. In my experience I have found it a great advantage and also a time-saver. After proving the occlusion, contour, etc., and the case is ready to flask, wax is flown to excess on the labial, buccal surfaces and the wax is carved to give the festooned effect, or use Dr. Wilson's method by applying waxed string to outline the festoons. The next step is to cover the buccal and labial surfaces with a strip of No. 60 tin foil. The No. 3 instrument of the Evans set of carvers is especially adapted for adjusting the tin foil. The strip of foil is placed over the wax and teeth, and pressed as closely as possible with the fingers. The surplus tin is cut away with scissors, allowing it to lap upon the teeth about one-eighth of an inch. The tin should be slit between each tooth. Hold the work in the left hand, seize the instrument by the hand grip, rest the thumb upon the occlusal surface of the second molar and burnish the tin closely to the tooth and against the festoon. Continue the same with all the teeth. The metal is now burnished over the remaining surface to give the desired thickness of the gum and the contour of the festoons. This is done by holding the plate and burnishing same as before. After burnishing the foil well around the festoons, the position of the case should be reversed in the left hand, so that the thumb of the right hand may rest upon the periphery of the base plate, while burnishing the foil from the festoons toward the periphery. Trim the tin flush with the periphery edge. The case is now ready to flask, but the flasking is done in three steps instead of two.

The case is imbedded in the first half of the flask bringing the plaster just up to the periphery. While the plaster is moist use liquid silex as a separating fluid, or after the plaster has set pain with a separating varnish. (Liquid silex can be made by dissolving one part of water glass (Drug-gist 15c tin) with two parts of boiling water). Place the second half of the flask in place and instead of filling the flask up full with plaster, just flow it in around between the flask and the labial and buccal surfaces of the teeth and extending over upon the occlusal surfaces of the bicuspids and molars and from there up to the upper edge of the flask, thus leaving the arch and the lingual surfaces of the teeth exposed to view. Our next step is to tin foil the arch. When

the plaster is set, soften a large piece of old impression compound and form it into a ball about the size of a silver dollar. Force this compound down into the arch, invert the flask and press it upon the bench, this forces the compound into place and also flattens the top. Chill the compound and remove it, then chill it again in cold water. This gives you a compound die with which to force the tin into place, doing away with burnishing. A piece of tin foil about 34 gauge and three inches square is used. Force the tin into the arch with the thumb and roughly burnish into place, using the wooden handle of a vulcanite scraper, remove and trim off the excess with shears. Replace the tin in the case and use the compound core to press the tin into place by placing flask on the bench and pressing with the hand upon the core. Remove the core and tin, and trim the tin, allowing it to lap over upon the teeth about one-eighth of an inch. Replace the tin and core in the case and press it home by placing flask in the flask press and tightening the screw upon the core. (Do not exert heavy pressure.) Remove the core and the tin will stay in place, the core having carried the tin well into place and reproducing any fine lines. Moisten the plaster in the flask, mix plaster and finish flowing the second half of the flasking. Press the top of the flask to place, let plaster set, then separate case, boil out the wax, pack, vulcanize and finish. This is done by peeling off the foil, trim the excess vulcanite off from around the teeth with sharp chisel and finish with stiff brush and pumice. Polish with whiting and soft brush. The method described to tin foil a case takes but a few minutes and has decided advantages. (1) It is the easiest and best method of forming the contour of the surfaces of the denture. (2) It eliminates time in finishing. (3) It produces a much more dense surface on the vulcanite. (4) The vulcanite is susceptible to a higher polish. (5) Additional strength is given to the denture.

*Factors of Importance in the Construction of Cast Gold Inlays**

BY MARCUS L. WARD, D.D.Sc., ANN ARBOR, MICH.

WHEN Dr. Weston A. Price presented a paper to this society on October 27, 1908, entitled, "The Detailed Technique for Making Dental Restorations on Artificial Stone Models," he was asked, according to the reports of the meeting, the following question by Dr. Capon, viz.: "In referring to that part of the paper where the essayist alludes to restoration in a mesial and distal filling united in one piece through the occlusal surface, he says the contraction will prevent it going to place, and to force it means simply to spread it out at the gingival margins, like the spreading of a horseshoe. I would like the essayist to explain how Dr. Taggart got such fine work by his methods, and I know from personal experience that dozens of such inlays have been cast and placed into the cavity without that spreading, and would bear the closest inspection."

The records do not show that Dr. Capon's question was answered at that meeting, nor at any time since by the essayist of that evening, or fully answered by anyone else since that time. The writer has been asked essentially the same question as the one asked by Dr. Capon so many times within the last five or six years that he is certain that, while a great deal has been done along this line of work, and a considerable amount written, there prevails a feeling that Taggart's gold inlays have never been excelled by the use of the stone model suggested by the essayist of that evening, by the use of other materials for the cast inlays, or by making use of the results of some valuable scientific research along this line of work. Those to whom Dr. Capon referred that evening have, I believe, continued from that time to the present to insert as beautiful inlays as they did then, and have found but a partial application for many of the theories advanced relative to this work that were not in harmony with the ones they were then practicing. That a most beautiful result is possible in almost every case is the belief of many, but the greater majority feel that there is an element of uncertainty connected with the construction

*Read before the Toronto Dental Society, Monday, 15th February, 1915.

of about every case they do. This condition of uncertainty, which in many cases is probably due to nothing more than faulty technique, is exaggerated oftentimes by the conflicting opinions that so often appear in the current literature. With a feeling that I have been in a position to investigate the merits of the different methods practiced, and theories advanced, in this work, both from a practical standpoint in a large clinic and a theoretical one in the physical laboratory, I wish to discuss some of the factors that I regard of much importance in the construction of the cast inlay.

From the introduction of the cast inlay to the present time there have been many who believe that Taggart had mastered the technique of making gold inlays when he presented the process that could not be detected from the foil filling when the two were in close proximity. Unfortunately it has been difficult to get all the methods employed by the designer of the process, and as a result some quite different procedures have been designated as Taggart's. Some have been designated as Taggart men because they use Taggart's machine. The writer has a close friend who uses a Taggart machine, but as far as is known he uses no other of Taggart's products, nor knows of Taggart's methods. Another is in mind who uses Taggart's products except the investment. The writer was recently designated as a Taggart man before one of the large societies of the country by a man who is a profuse writer on the subject of casting because I use a comparatively cool mold when using the Taggart machine. The fact is, however, that I have for the use of my students, besides the Taggart machine, five centrifugal machines, one compressed air machine, and one vacuum machine, advising as hot a mold as can be obtained without getting the shrinkage in the investments that occur with temperatures upwards of 1000F. for use on the vacuum appliance; the removal of the mold from the flame as soon as the investing material is dehydrated to the extent that vapor could not be seen rising from the mold and a piece of the same wax that was invested would rapidly disappear when placed upon the surface of the mold, and the cast made immediately when it was to be done on the centrifugal appliance; and, from this temperature to that of the room, or to freezing point when using the Taggart machine.

These machines have been treated as devices for delivering pressure. The amount of pressure available and that

actually delivered upon the gold has been taken into consideration when using any one of the types of machines mentioned as having been used. The condition of the mold relative to the delivery and maintenance of pressure has been considered. The rapidity with which the pressure could be delivered with the different types of machines, the nature of the casting to be made, the size, location and number of sprues to be employed, the detail in some castings that can be sacrificed to the benefit of others, have each been studied simultaneously with the delivery of pressure by the machine and the influence of the temperature of the mold upon this pressure.

As a result of these observations we have found that we can produce more satisfactory reproductions of wax models in gold by the use of technique that had been worked out for the production of the particular casting to be made and the machine to be used.

In no instance has the writer advocated the cool mold for all kinds of work nor for all types of machines. In *Cosmos* for September, 1909, I advocated the cool mold in discussing cast inlays, but did not anticipate at the time of writing that article (February, 1909), that there would be any necessity for working out a technique for use with pressure devices that have their efficiency modified by so many parts of the technique necessary to construct a cast inlay, as do some of the present vacuum appliances now in the market.

Whether or not Dr. Taggart produced the beautiful results that Dr. Capon referred to by the use of the cool mold, the use of the artificial stone model referred to by Dr. Price, the hot mold referred to by Dr. Van Horn (*Cosmos*, 1910, Page 878), the more recent suggestion of Dr. Price that warm water be used for investing the wax model, the taper walled cavities to be discussed later, or any other particular kind of technique, cannot be stated definitely at this time. The writer ventures the assertion, however, that not only Dr. Taggart, but dozens of others, can produce cast gold inlays that cannot be excelled at the present time without the use of the artificial stone models, the hot mold, or the warm water for investing the wax pattern.

It seems safe to assert that those who have produced the beautiful results that have been referred to have invariably been excellent technicians in other lines of work, and that they have pursued a practice more like that referred to by Ottolengui in *Cosmos*, January, 1915, than to assume

that they have been extremists and known in this work by the use of a cold mold or a hot mold, or any form of extreme technique. Ottolengui says in the article referred to, under the heading "The filling of teeth with cast gold inlays, and the present state of the art in the United States," "The true method of casting does not depend upon the utilization, but rather upon the avoidance, of extremes of temperature. The wax should not be chilled; the investment should not be made with cold water, and the mold should not be extremely hot when the cast is made. On the contrary, the effort should be made to work as close to room temperature as possible, the wax and investment thus being neither warmer nor colder than the surrounding air, while the mold itself should be as cool as possible, and consequently as little expanded as possible. Success, indeed, depends more upon a constancy and accuracy of technique than upon the utilization of any extraordinary means of overcoming faults which should not occur at all."

With the possible exception of Dr. Ottolengui's statement regarding the cool mold, his views relative to the production of good castings, and the assumption that men producing fine results have been fine technicians, seem to answer very largely the question asked by Dr. Capon. In the production of the cast inlay there seems to be several steps, any one of which may contribute to the success of the operation, but in all instances it takes a good technician to get good results. Those who are unfortunate enough to be unable to secure a beautiful wax pattern with well defined edges need not expect that the casting will be any better. And, those who have not mastered the handling of chisels need not expect to be able to get good wax patterns. Whichever of the two types of cavities, that will be discussed later, the operator chooses to adopt, he must possess and learn to use at least the following instruments from Black's set, viz., Nos, 49, 50, 51, 52, 53, 54, 77, 78½, 79, 80, 81, 82, 83, 84, 85, 99, 100, or he must have their equivalent in some one else's set. From personal experience the writer has observed that not a large enough number of the profession have ever followed the teachings of Black and others about outlining cavities to enable them to carve a wax pattern to a definite outline or to finish the margins of a cast gold inlay after it has been inserted into the cavity. Neither has the mechanical work on cavities for inlays been of a high enough order. Both the outline of the cavity and the degree of mechanical skill exercised in finishing seem to be factors

of first importance. There has been a tendency on the part of many who have formerly practiced the laying of cavity margins down on areas that would be cleansed by excursions of the food in chewing, to do less extension at the cervical margins, for two reasons, first, because it enabled them in most cases to prepare cavities for the inlay that had inclining walls without excessive extension of the occlusal surfaces of the teeth, and, second, because the present demand for better oral hygiene seems to warrant it. There are some, however, who advocate almost if not quite as much cervical extension for the inlay as for the foil and other fillings, which means, according to their teachings that the cervical portion of proximal cavities in highly susceptible cases is wider than the occlusal portion.

While the writer has been, and is now, a firm advocate of extension into areas of relative immunity, the practices of trying to get an accurate wax model in all the cases that are found in a large clinic, where the duration of the operation and comparative weakness of the finished operation seem to exclude the possibility of inserting a gold or other filling, when there were walls parallel to the long axis of the tooth, or, as some advocate, a cavity even wider at the cervical than the occlusal, has resulted in such comparatively poor results that it has been abandoned.

The question may well be asked, why not do the same extension for the inlay as for the foil filling. If accurate wax models could be made equally well in both cases, and if the contraction of gold in such shaped castings was equally well cared for, there would seem to be no reason for the distinction between cervical extension for inlays and cervical extension for foil and other fillings. While some claim that there is little or no necessity for the distinction, it appears that they are in the minority, and are in reality trying to adapt the inlay to the cavity preparation previously used for foil and other fillings. A recent statement by one who has been one of the closest students of Dr. Black's teachings seems to indicate a tendency to take a more rational view of what has appeared to many of the profession's finest cast gold inlay workers as an extreme view of the question of cervical bucco-lingual extension of proximal cavities. The statement referred to was, "I have about decided that when the case seems to demand wide bucco-lingual extension of the proximal cavities at the cervical, I will accomplish this with something else than the inlay." This assertion admits the inability of this well-

known operator to make satisfactory cast gold inlays in cavities of the nature of those mentioned (see cut No. 1), and appears to bring out the limitations of the inlay in this respect. It is doubtful, however, that those of the profession who are most sincere in their advocacy of better hygiene for their patients are always allowing the question of whether an inlay or foil filling shall be inserted, to be decided by the amount of cervical extension in a bucco-lingual direction that seems to be advisable. On the other hand, it would seem that better hygiene was being substituted in many of these cases for the former practice of wide

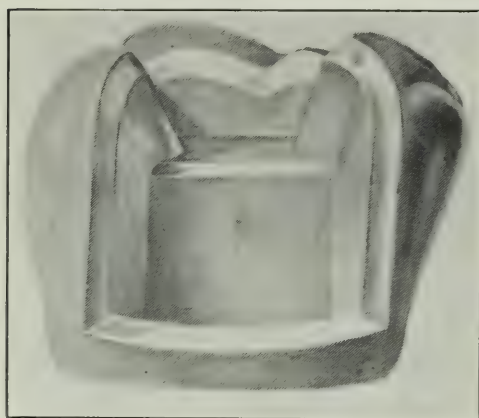


Figure No. 1.

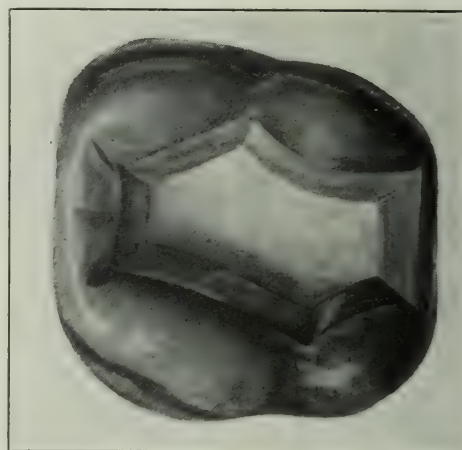


Figure No. 2.

cervical extensions, and likewise the cast gold inlay is taking the place of the foil filling in many of these cases.

Since the writer has been unable to secure uniformly accurate wax models, or to get some of the most skilled students to do it, from cavities similar to the one shown in cut No. 1, and, since the contraction of the gold in cooling in compound fillings interferes to a greater extent with the walls of the cavity nearly parallel than it does when the walls are somewhat more tapered, he has made a study of how much taper could be employed without losing necessary retention form. Obviously, in cavities of the shape shown in Figure No. 2, where only inside dimensions are to be considered as little taper as will permit the drawing of an accurate wax model will be all that is necessary for the shrinkage of the gold in cooling will facilitate the insertion of such a filling. In Figure No. 3 much the same is true, though we have here besides the internal dimensions of the cavity, two external ones. In Figure No. 4 we have the internal dimension of the cavity and three outside ones. In Figure No. 5 the gold ring on mandrel represents a cast-

ing entirely encircling the object from which a wax ring was made. It may be seen that the ring does not go down on this mandrel with a taper of one hundredth of an inch per

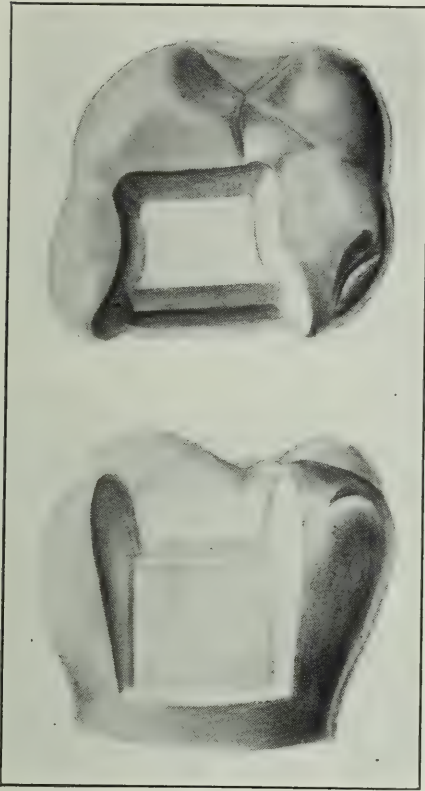


Figure No. 3.

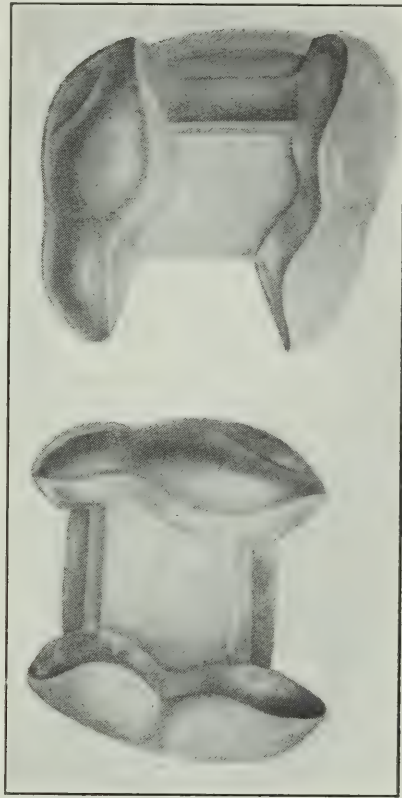


Figure No. 4.

inch nearer than about $\frac{437}{1000}$ of an inch to the place from which the wax ring was removed. Obviously, the trouble encountered from the contraction of the gold will be

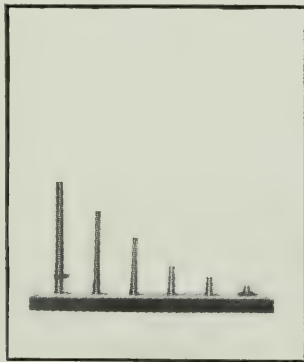


Figure No. 5.

in proportion to the number of outside surfaces to be fitted. In cavities in the occlusal surfaces of the bicuspid and molars there should be little, if any, trouble in getting a cast

gold inlay to place. In proximo-occlusal cavities in the same teeth there should be but little trouble. In compound proximal cavities, however, and in casting copings, etc., for roots of teeth, where the casting nearly or quite surrounds the object from which the wax pattern was made, a more difficult problem is presented. From the beginning, the compound inlay and the cast base crown have been the most difficult to construct. At least three of the profession's well known men have furnished evidence of this, one with a clinic on how to correct the cervical deficiency in gold inlays, another with articles and cuts and a clinic to show how to construct a cast base crown by first adapting to the root and crown a plate of 24 carat gold. In other words, he is not attempting to adapt wax to the end of a root or a model of it and expecting a casting from this wax pattern to be satisfactory. Before the Lake Erie Dental Society, in 1912 (Summary, 1913, Page 92), Goslee stated that "in the construction of gold crowns by the casting process, the fit or peripheral adaptation is, however, because of the spreading tendency of the wax, always best obtained by previously fitting some form of band to the root and then casting directly to it."

Before the Kentucky State Dental Society, in 1913 (Summary, 1914, Page 102), in discussing the cast base crown, he says, "In the various methods now generally used and advocated, good, accurate results are difficult to obtain, because the very plasticity of wax it possesses a tendency to spread when subjected to the pressure necessary to mold it to a clean close adaptation. This tendency has made it practically impossible for me to obtain a satisfactory degree of accuracy of adaptation to the root-end. However, such difficulty may be entirely overcome, and absolute accuracy obtained in all cases by first adapting a cap of thin pure gold (about 36 gauge) to the root-end." Later in the article he says, "Also, such a procedure reduces to a minimum the possibility of any change of form which may result from the warpage or shrinkage of the gold or alloy used in casting, and this is a very important consideration."

Approximately one year later (1914), at Detroit (paper yet to be printed in Dental Summary), in discussing the subject of crown and bridgework, he made essentially the same statements as he had previously made at Louisville and Lake Erie Society in regard to the cast base crown.

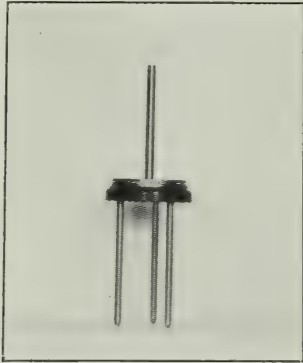
Under date of January 14, 1915, I have from him a letter in which he says: "Replying to your question, will say that

I have not changed my method of technic with regard to crown construction in any respect since my meeting with you in Detroit last year, and am still adapting the cap to the root by means of swaging pure gold or platinum on an amalgam die. An extended experience has convinced me that this is the only method by which I am able to obtain the degree of accuracy in the adaptation of my crowns to the root which I desire to obtain, and in addition to the accuracy obtained by previously swaging the thin cap, its very presence minimizes the warpage and shrinkage of the metal used for casting, hence, making possible a better adaptation than might be obtained from the use of wax alone."

We have here repeated statements, covering a period of four years, from one whose identification with the object of crown and bridge work is such that his opinion can hardly be counterbalanced with that of any other one man, that he can get a better result by not attempting to construct cast base crowns by adapting wax to either the root or a model of it without first adapting gold or platinum to it. It has been the experience of the writer in both private practice and in handling a large clinic, that cast base crowns, made by methods other than by adapting gold or platinum (preferably gold) to the end of the root or model, have been so unsatisfactory that their construction has been abandoned except as a last resort in a few badly broken down cases. The question, then, of how some men get such beautiful results as were referred to by Dr. Capon, without the use of the artificial stone model to prevent the gold from contracting, or the expanded wax pattern recently suggested by Dr. Price, may be answered by the statement that they do not do cast base crowns, unless they have a plate adapted to the end of the root, which method must be considered as a factor, first, in preventing the gold from contracting, and, second, a method that ensures the presence of the peripheral margin.

The compound inlay, with three outside surfaces to be fitted instead of four, as there is with the cast base crown, has been done by some of the profession's best technicians by pursuing much the same methods as are suggested by Ottolengui, without the use of plate that is suggested by Goslee for the cast base crown. The fact that such castings do not entirely encircle the object from which the wax was removed and permit of a little stretching, must be remembered. Cut No. 5 shows a set of hardened steel mandrels,

the first and largest one has $1/100$ of an inch taper in every inch, the second has $5/100$ inch taper per inch, the third $10/100$ inch taper per inch, the fourth has $15/100$ inch taper per inch, the fifth has $20/100$ inch taper per inch, and the sixth has $25/100$ of an inch taper per inch. Cut No. 6 shows a hardened steel mandrel that is a duplicate of No. 1 in cut



Figures No. 6.



Figures No. 7.

No. 5 to the $1/10000$ of an inch, together with a "raising device" (see cut No. 7) for raising a wax ring off the mandrel without distorting it. When a wax ring or washer is raised off the mandrel for this purpose and a gold casting made from it, it will not go nearer than $437/1000$ of an inch (see cut No. 5) to the place the wax came from, owing to the contraction of the gold in cooling down. By passing this casting down the mandrels successively tapered from one $1/100$ inch per inch to $25/100$ of an inch per inch, it may be seen that it goes to within $16/1000$ of an inch on the $25/100$ of an inch per inch taper (see cut No. 5). The writer has not been able to get a casting to go nearer to the bottom, even with a $25/100$ of an inch per inch taper, than about $16/1000$ of an inch. The difference between $437/1000$ of an inch and $16/1000$ of an inch approximately represents the effect of a $25/100$ of an inch per inch taper over a $1/100$ of an inch per inch taper on a washer with a diameter of a half-inch and a one-fourth inch hole through it, with the technique that we are using. This amount is very plainly seen. The space between the base of the mandrel with the $25/100$ of an inch per inch taper and the gold washer, which is approximately $16/1000$ of an inch above it, is also plainly seen. When compound inlays in molars and bicusps are constructed with the same technique, however, they will pass to place so closely when made of 24 carat gold that no space is seen, providing the taper in the cavity is approximately $25/100$ of an inch per inch, and especially at the

points represented by "A & B," cut No. 4. To eliminate the possibility of the elasticity of the tooth entering into the problem the same cavities have been prepared in steel and porcelain in large enough bulk to resist any ordinary stress, and the result has been the same. The reasons for the washer not going to place and the compound inlay going to place appear to be due to the shape of the inlay being such that it is stretched when but lightly pressed over a taper; second, the material is capable of being stretched with this amount of force, and, third, that the linear dimensions of such inlays are smaller than those of the mandrels, consequently less contraction takes place.

That all three factors contribute to the placing of these compound inlays at various times, if not all the time, I think there can be little doubt.

Cast gold can be stretched when pressed over a wedge with a force of four or five pounds when in the shape of a compound inlay in a thickness of not to exceed $125/1000$ of an inch. This is an easy experiment to carry out with very ordinary instruments for the measurements. If, however, the compound inlay be made of gold alloyed with platinum or copper or some other metals, the thickness that can be stretched is reduced in some instances to $31/1000$ of an inch and even less in others. It should be remembered in this connection that when once placed in the cavity the compound inlay is not subjected to the leverage of the wedge on the inlay some distance from the place being stretched, though there is a much larger force than four or five pounds placed upon the inlay in most of such cases. No such stretching of 24 carat gold in proximal or compound proximal inlays has been observed after the inlay has been placed, providing the cavity form had a good foundation and what would be called one of Black's occlusal extensions, except in a few anterior inlays that have been done in raising the bite for men where the conditions would seem to excuse the insertion of gold inlays in the anterior part of the mouth. This has led the writer to believe that those who are so enthusiastic about the use of alloyed golds for making inlays are using a cavity formation that would not be accepted by the students of Black's work or those practicing a somewhat tempered form of it.

Only when students or others doing the work have made the shallow and narrow occlusal formation, or have failed to get a good foundation for the inlay, have we observed the trouble so often described by some. On the other hand, we

have observed the stretching of these inlays in a mesio-distal direction, and to take advantage of it in the finishing of the inlay we adhere closely to the beveled cervical margin (see cuts Nos. 4, 3), so that this thin part of the inlay may be burnished tight against the tooth. The third of the factors that appear to contribute to the close seating of the compound inlay is the difference between the size of the mandrel and the size of the average inlay. The mandrel is 250/1000 of an inch in diameter at the base. In our clinic during the last six years, however, we have never found a compound inlay that exceeded 203/1000 of an inch, and only one that came near to this size. This may be because we are getting smaller teeth to operate on, or because we are selecting our cases more carefully than others, but it does not appear to be either. If the cavity shown in the last Bulletin of the National Dental Association in the article by Dr. Price on Page 118 (see Cut No. 8), and which he says "reproduced



Figure No. 8.

as nearly as possible the actual condition obtaining in the molar tooth one-fourth inch in diameter with an MOD cavity, all walls of which had a taper of one per cent. to a common perpendicular," and if the inlay shown in cut No. 9, which is a photograph of an inlay recently made at a casting contest where the cavity was supplied by the committee in charge, and if dozens of other similar cases that can be presented can be taken as an indication of what hundreds of the profession are doing in their cavity preparation for the inlay, there is good reason for believing that the reason why we do not get cavities that are one-fourth inch across the step portion is that we are cutting thicker seatings for them.

Whatever be the verdict of the profession relative to the cutting of good deep seatings for the cast inlay, the opinion of the writer will remain that cavities for the compound inlay that are one-fourth inch across the step portion have a poor seating. It seems, therefore, that the contraction of gold as shown by Dr. Price in the cavity that he says

represents the conditions that obtain in the molar cavities, and the amount shown by the mandrels that are one-fourth inch in diameter (see Cut No. 5), is greater than the amount that will take place in the largest compound inlays for molars if they are prepared with the extension and seatings recommended in Cuts Nos. 2, 3, 4.

The compound inlay, then, that has a short portion of metal between the proximal portions has a less linear contraction when the gold cools down than the one that is two or three times as long, consequently such an inlay will not show the amount of spreading that was referred to by Dr. Price in his paper before this society in 1908, and which seems to be accounted for by the shape of his and the other cavity previously referred to.

The cavity shown by Dr. Price and the one that was prepared for the casting contest referred to, both show a taper of about $1/100$ of an inch per inch, an amount not visible when the tooth is in the hand, except under the most favorable light conditions and when the tooth is revolved into certain positions. Under the conditions that exist in the mouth, it seems impossible for anyone to be sure that there is a taper at all when there is as little as $1/100$ of an inch per inch. If this amount would let one of the compound inlays down as far as a $25/100$ of an inch per inch taper, would it not seem strange that anyone would adopt an amount that they could be sure of under all conditions for the sake of the removal of the wax? The question might be asked why are such cavities as shown in Cuts Nos. 8, 9,

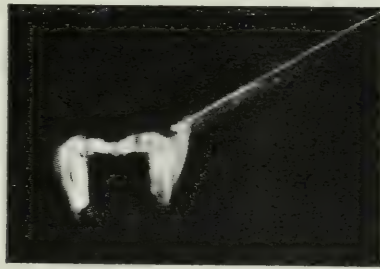


Figure No. 9.

with little or no taper and practically no seating form presented, as representing actual conditions in the molar teeth. In the case of the one from the committee shown in Cut No. 9, I think that it is quite indicative of the general condition that prevails in the profession relative to extensions, seatings, and tapers for the inlay. In the case of the test cavity shown by Dr. Price, I would be inclined to think that

he had prepared the hardest cavity that could be prepared and come anywhere near to the conditions in the month for the sake of bringing out different methods of technique were it not for the fact that he suggests that the wax from such cavity be expanded so that the inlay will go to place.

While it is difficult to say exactly why these types of cavities are represented, there appears to be no question about their being presented by a great many because they have never been impressed sufficiently with the matter of extensions and seatings. The question of tapers is one that does not date far from that of the origin of the general use of the inlay method of filling teeth, and it is not to be supposed that everyone has had this feature of cavity preparation for the inlay brought to their attention as it may be with a set of mandrels with varying tapers. When the writer first began the work with the cast inlay he was under the impression that it was necessary that the cavity have as nearly as possible parallel walls to get the greatest possible retention, leaving little for the cement to do except to prevent the inlay from being drawn up out of the cavity. It had not occurred at that time that the inlay would go down farther on a taper of 25/100 of an inch per inch than it would on the 1/100, or the least amount that could be seen definitely. Later, however, when he was in contact with one in the same practice who was following the practice of prophylaxis and the treatment of pyorrhea, it became necessary that an improvement be made in the condition of the proximal inlays at the cervical.

This led to the study of what was the matter, and it was found that the proximo-occlusal inlays were better in this respect than the compound proximo-occlusal ones were. This led to the study of why this was true, and it was found that it was because the compound inlay was spread out, in the manner suggested by Dr. Price in his paper before this society in 1908, at the cervical portion.

Immediately a study of the effect of tapers was made, and it was found that from 10/100 of an inch per inch to 25/100 would allow the inlay to go to place better than the very small amounts that had been used. The question of how much loss of retention there would be with tapers of this amount was then undertaken, with careful records, and it was found that, if the cavity were one that had a normal height from cervical to occlusal, and if a good seating was made, and the occlusal portion was made of such width and thickness as would be accepted by an authority on cavity

preparation for other materials, tapers of 25/100 of an inch per inch could be used without trouble from inlays being dislodged. The linear distance of the cavity from cervical to occlusal, the seating, and the size of the occlusal, all appear to have a bearing on the dislodgment of the inlay to as great, if not greater, an extent than the amount of taper up to 25/100 or 30/100 of an inch per inch.

Since taking up the work in a large clinic, these observations have been verified with records that show that not quite one-half of one per cent. of the several thousand inlays inserted have become dislodged when placed in such cavities as shows in Cuts Nos. 2, 3, 4, with tapers of 25/100 to 30/100 per cent. per inch. The adoption of the tapers suggested, however, did not complete the study of how to improve the cervical portion of the compound inlays. The question of how to finish this part of the inlay soon resulted in using a larger bevel at the cervical, so that it could be burnished close to the cervical to make up for the slight amount of spreading that was noticed with even as much as 25/100 of an inch per inch taper was used. This bevel may be seen on the cavities shown in Cuts Nos. 3, 4. The burnishing of this part of the inlay to the tooth, and the subsequent finishing, soon led to the conclusion that 24 carat gold was preferable for these inlays because it had proved strong enough when put in sufficient bulk, and was much easier and better finished in these comparatively inaccessible places.

This experience with a specialist in the treatment of pyorrhea and practice of oral prophylaxis, together with several years' contact in a large clinic with those in charge of the gold foil fillings, who have demanded that inlays to be good for several years must look so near like gold fillings that they cannot be told apart, has caused a close adherence to the shape of the cavity shown in Cut No. 4 when inserting the compound inlay, and the use of 24 carat gold. The factors of importance are, a taper of all walls of from 10/100 of an inch per inch to 25/100 of an inch per inch, depending upon the linear distance from one proximal portion of the cavity to the other, and a good bevel at the cervical, as shown in Cuts Nos. 3, 4.

A form of cavity which has been widely demonstrated and written about is shown in Cut No. 1. It differs from those shown in Cuts Nos. 3, 4 by having a beveled margin all around the cavity and has almost parallel walls. Such cavities have been advocated, and are shown in Items of

Interest for 1911, in the writings of one of the profession's good gold workers, Dr. J. V. Conzett.

More about the question of parallel walls seems unnecessary. The beveled margin all around the cavity is a subject about which more may be said, however. Dr. Conzett and those following this form of cavity preparation for the inlay seem to claim a better protection to the enamel rods as a result of this bevel. Some of those who have previously taken the same view of the matter have more recently stated that they were able to give the same protection with the cavity formation shown in Cuts Nos. 3, 4, the difference in protection being a question of whether there was the same occlusal extension in both cases. In studying a large number of cases it may be found that this view of the matter is approximately correct, though in some it may be necessary to give the taper to the step portion of the cavity more than 25/100 of an inch per inch taper to get the same protection shown in the cavity with the margin beveled all around. The objection to this form of cavity in the writer's hands has been inability in most cases to get the inlay down into the cavity as far as could be done with the form shown in Cuts Nos. 3, 4. Upon examination it has been found that when the casting is made of 24 carat gold the greater part of it that covers the bevel may be bent with comparative ease, but the junction of the bevel with the main portion of the step is the first to hold the casting from going to place. Inability to produce such angles with investing materials as soft as are now available has caused the abandonment of the bevel in this portion of the cavity, the beveling or rounding of such angles as are shown at (a) Cut No. 1, and the removal of some from the casting at (a) Cuts Nos. 3, 4, when it appears that a thin edge of investing material was present at this place when the gold was forced into the mold.

Like the question of the temperature of the mold when the cast is made, much has been written on the behaviour of the different waxes used for patterns. Almost simultaneously came reports of experiments by C. S. Van Horn and Weston A. Price in 1910. In discussing the subject of casting, Van Horn says (*Cosmos*, 1910, p. 877): "It was proved that a pattern (wax cylinder) at the temperature of the water with which the investment was ordinarily mixed (say 54° to 56° F.), the temperature of the water used in conducting the first experiments for this paper, was some 0.0014 inch shorter than was the pattern at body tempera-

ture. Now, 'it's a poor rule that will not work both ways,' therefore, to neutralize the shrinkage of gold, expand the wax pattern by having the investing material and the flask at a temperature sufficiently above the normal body temperature, when the pattern is invested to compensate for the shrinkage of the gold, which is in excess of the expansion of the investment. Later in the same article he advises using water at the temperature of 115° to 120° F. for mixing the investing material. It may be noted that the quotation implies that when wax is removed from the cavity to the investing material that there is a reduction in temperature of over 40° F., and a reduction of the wax pattern as a result. To overcome this, and to counteract the contraction of the gold, he advises the expansion of the wax pattern with water for mixing the investment at 115° or 120°. This would seem to be a good basis for the statement of Ottolengui, previously quoted, that the "true method of casting does not depend upon the utilization, but rather the avoidance of extremes of temperature," etc., etc. In *Cosmos* for 1910, page 226, Dr. Price says of the "Factors of error in the Taggart direct method": "The wax for its pattern is put in the cavity at its workable temperature, which will be for the various waxes from 95° F. to 130° F. It is cooled in the cavity, to render it firm and strong, to about 67° F., and in so doing it contracts, according to its formula, one or two per cent. of its linear dimension. If invested at this temperature, an error of this definite amount is already carried forward, to appear in the final inlay, unless it be corrected by some other step." This implies that when a wax is cooled in the cavity that it shrinks, and that the shrinkage is not corrected at the margins by the carving of the wax. Again the comment of Ottolengui seems appropriate, for the wax pattern is not smaller at the margins when carved with a warm spatula by a clever technician.

Continuing, in the same article, Dr. Price says: "If the wax of the pattern, when being formed and cooled, surrounds the tooth structure, covering outside dimensions, it will be stretched as it cools, and it would by so stretching apparently correct part of all of the error of contraction from cooling; but all waxes have elasticity, and hence do not remain stretched, which introduces a new uncertainty or error to change the accumulated error. When the wax pattern is invested, its temperature will determine partially its dimension, for on heating from 67° F. to 100° or to

130° F., the wax will be expanded, and if not carried to the softening point at which surface tension will distort it, or where the investment will change its shape, part or all of the accumulated error due to contraction of the wax may be corrected, and with a certain definite technique, to be explained later, even an error of expansion produced. The ordinary technique will not show the true expansion. Heating the pattern to enlarge it will release its elasticity and allow much distortion.

“In the next step, of heating the investment material, if it be of the best quality we may have an expansion of about one per cent., or if of poor quality we may have a contraction of two per cent., according to our manipulation, and if the investing compound is soft and yielding it can be distorted easily by the pressure of the gold when casting, thus causing an error, which is not a uniform expansion.

When the molten gold is forced into the investment, its physical state changes from liquid to solid, and here we have what has heretofore been an entirely unknown factor, but which we will show later to be a very large contraction; and again, on changing temperature from its freezing-point and cooling to normal temperature, it contracts, as the writer has previously shown, over two per cent. (Items of Interest, May, 1908.) This contraction can be partially controlled by pressure on the congealing gold, thus forcing gold from the spure, and partially by holding the gold as it contracts, *i.e.*, by causing it to surround a strong form, thus preventing the normal contraction.

“The relation of the size of this final casting of gold to the original cavity in which the wax pattern was made may thus vary through a wide range, and the final error is the sum of all the plus and minus changes made in the size of the record of the cavity, as it passed through the different materials and processes. We will show definitely the amount of change produced by each step.

“To work intelligently we must therefore know the behavior of the materials used for each step, and make the unfixed or variable changes correct the fixed changes. * *”

(To be continued in next issue)

MULTUM IN PARVO

This Department is Edited by C. A. KENNEDY, D.D.S., 2 College St., Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS
OF THE PROFESSION, WILL BE GREATLY APPRECIATED BY THIS DEPARTMENT

HINTS ON SOLDERING IN PORCELAIN WORK.—Borax must not be allowed to touch the porcelain. The investment is heated on each side and from below until the surfaces to be soldered are sufficiently hot to make the solder flow, at the same time making sure that the porcelain is hotter than the pins, and having perfect union of the parts to be united. If the solder flows to one side more than to the other side, increase the heat of the investment on the sluggish side.—*S. H. Voyles, Lea Odontologia, Argentina (Dental Cosmos).*

IN SOLDERING PORCELAIN FACINGS.—Do not bend the pins in facings to be soldered and they will seldom crack.—*C. G. Scott, D.D.S., Toronto.*

ADDING NEW PLASTER TO OLD.—If you wish to add new (soft) plaster to old (hard) plaster, do not wet the latter, but add the new fairly thin. It will adhere very tenaciously.—*C. G. Scott, D.D.S., Toronto.*

CLEANING GLASS.—If the fountain cuspidor or other office glassware becomes coated with a white deposit from hard water, a few drops of nitric acid will dissolve the coating and leave the glass sparkling and bright. The acid may be easily applied with a pellet of cotton held in tweezers.—*Western Dental Journal.*

TO REMOVE BLOOD STAINS.—To remove the blood stains from white clothes, pour some $H^2 O^2$ on the spot and wipe it off with alcohol.

FILLINGS.—By dipping gold brunishers in a solution of pure castile soap, a gold filling may be burnished to a mirror-like surface; however, the labial surface of a gold

filling is less conspicuous if a fine cuttle-fish strip or disk is used on it at the last, as this leaves a satin finish.

LIQUID FLUX.—A splendid liquid flux for light soldering and surface work can be made by using equal parts of borax and boracic acid made into a saturated solution in distilled water. Pitting is avoided by using this flux.

CALCIUM LACTATE AS A SAFEGUARD AGAINST HEMORRHAGE.—It is not uncommon that cases present for extractions that give a previous history of severe and long-continued hemorrhage. One of the simplest and safest drugs for controlling this idiosyncrasy is calcium lactate. A dose of 5 grains three times a day, for several days before the operation, generally ensures an absence of trouble in this direction. The drug can be obtained in tabloid form, and can be continued subsequent to the operation, if any doubt still exists as to the possibility of secondary hemorrhage.—*E. S. Fischer, Australian Journal of Dentistry (Dental Record)*

A GOOD MEANS FOR DISENGAGING ADHERING IMPRESSIONS.—If an impression sticks to the palate, the patient is requested to close the lips and to puff out the cheeks forcibly, which will separate the impression from the palate.—*La Odontologia Colombiana (Dental Cosmos)*.

THYMOL IN THE TREATMENT OF ALVEOLAR ABSCESS.—Thymol dissolved in oil of eucalyptus is very useful in the treatment of blind chronic alveolar abscess.—*La Odontologia Colombiana (Dental Cosmos)*.

VULCANITE DENTURE, TO REMOVE PLASTER.—Now and again a thin coat of plaster on the palatal surface, or between the teeth of a vulcanite denture, proves difficult of removal, especially if the case is not promptly removed from the flask after vulcanizing. Place the denture, for a few minutes, in a cold mixture of about equal parts of sulphuric acid and water, or the "pickle pot"; no injury is done to the denture, while the plaster is softened or dissolves, so that a little work with a brush wheel leaves it clean.

Society Announcements

Ontario Dental Society

NO DOUBT you have already set aside the dates, May 10, 11, and 12, to attend the Ontario Dental Convention at the R.C.D.S., Toronto. Arrangements have been made with the Eastern Canadian Passenger Association for the usual reduced rates. Full information may be had from your local agent.

Excellent papers will be given by Dr. W. E. Harper of Chicago, Dr. R. J. Callahan of Cincinnati, Dr. E. W. Paul, Toronto, and Dr. J. A. Bothwell, Toronto. Interest will be added to these papers by Lantern Slides and Table Clinics.

Superior Clinics will be provided by local societies throughout the Province. A complete programme will be mailed on or about May 1st.

Additional information will be gladly supplied by W. E. Willmott, D.D.S., Chairman of Programme Committee.

Eastern Ontario Dental Association

THE Eastern Ontario Dental Association will meet at the Grand Union Hotel, Ottawa, on Wednesday evening, Thursday and Friday, June 9th, 10th, and 11th, 1915.

The following have consented to read papers: Drs. E. H. Wickware, A. T. Morrow, S. W. Bradley, M. F. Cross, C. H. Juvet, and J. H. Putman, Inspector of Public Schools, Ottawa.

The Entertainment Committee is preparing something elaborate for the benefit and pleasure of the guests. The Executive and other committees are looking forward to a most pleasant and profitable meeting.

Those planning to attend the convention should note that the meeting will be held a week earlier than the date originally announced.

Further information will be gladly supplied by W. C. Macartney, D.D.S., Ottawa, Secretary, Programme Committee.

ORAL HEALTH

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Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, 229 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to the Publishers, Oral Health, 229 College St., Toronto, Canada.

Vol. 5

TORONTO, MAY, 1915

No. 5

EDITORIAL

Canada Leads in the Organization of an Army Dental Corps

THE recent organization, in Canada, of an independent Army Dental Corps by the Honorable the Minister of Militia, Major-General Sam Hughes, will be welcomed by the entire dental profession. Some such plan has been urged for years as the only way to make the work of the Army Dental Surgeon effective. The new regulations will place the Dental Corps upon the same footing as the Medical and Army Service Corps.

In discussing plans for the organization of the Corps, with a committee representing the Canadian Dental Association, the Minister of Militia was most sympathetic toward the attitude of the committee, and agreed that the dentist in the army should have equal rank with the physician, and that the highest efficiency could only be attained by the establishment of a separate dental unit whose work would

be supervised and controlled by a dental officer. The only doubt in the mind of the Minister was whether in the treatment of certain cases in the oral cavity, there would be conflict of authority as between the surgeon and the dentist. The committee suggested that certain cases could best be treated by the surgeon and the dentist in co-operation. There would, however, be no more danger of conflict between these officers in the militia than there is now between physicians, surgeons, and dentists in civil practice. It was pointed out that the medical and dental professions are organized and administered independent of one another, and there is a perfectly clear understanding between the two as to the legitimate field of either.

Army Dental Surgeons in Canada have heretofore been attached to the Medical Corps. The dental profession has been dissatisfied with this arrangement as not resulting in the highest efficiency. The Army Dental Surgeon and his work have been frequently treated as of minor importance from a military standpoint.

The dental problems presenting in times of war have been such as to almost stagger the authorities. Thousands of recruits were rejected solely on account of dental defects who could, with a proper dental organization, have been easily made fit. Thousands of other recruits that were accepted required extensive dental services before being sent abroad for active service. The Army Medical Corps soon found itself with dental problems of such magnitude that civilian dentists had to be called upon for their active assistance.

War conditions have shown conclusively the absolute need for an efficient dental corps in the army, and the Minister of Militia is to be heartily commended for his fearless and prompt action. The Minister will receive the sincere appreciation of the entire dental profession, for in the midst of unusually heavy duties and responsibilities, he has taken a keen interest in the question and has given it his undivided attention.

The advanced position taken by Canada will, no doubt, be of great assistance to members of the profession in other countries in their effort to have the Dental Surgeons placed upon equal footing with other branches of the army and organized in such a way as to make possible the rendering of the best possible service.

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THE Committee representing the Canadian Dental Association, that waited upon the Honorable the Minister of Militia and Defence, in relation to the organization of a Dental Corps, was introduced by Dr. James L. Hughes of Toronto and was composed of Drs. Chas. F. Colter, Toronto; C. K. Gibson and J. Alex. Armstrong, Ottawa, and A. E. Webster and Wallace Seccombe, Toronto.

The thanks of the Dental profession are due, not to the Committee alone, but to Dr. Hughes of Toronto, who has evinced a most active interest in the success of the movement.

Twelve R.C.D.S. Students go to the Front

THE undergraduate body of the Royal College of Dental Surgeons of Ontario will be honorably represented upon the firing line by twelve of its number. These are: G. S. Atkinson, Artillery; W. G. MacNevin, Artillery; A. G. Lough, R. H. Atkey, Casualty Clearing Station; J. W. Macdonald, J. G. Roberts, Base Hospital; A. W. Jones, T. E. Walker, J. G. Larmour, and E. S. McBride, Artillery; J. E. Dores and R. H. Wing, Base Hospital.

New Army Dental Surgeons

THE following Dentists were recently appointed Army Dental Surgeons:—

Drs. Fred. Mallory, F. F. Willard, H. A. Semple, L. L. Matchett, all of the City of Toronto.

Officers Required for Dental Corps

THE Militia Department has issued the following memorandum:—

“There are vacancies for officers in the Canadian Army Dental Corps. Qualified Canadian Dental Surgeons, desirous of serving at the front, should make immediate application to Capt. J. Alex. Armstrong, Chief Dental Officer, 209 Sparks Street, Ottawa. If applications are telegraphed they should be followed by particulars, giving age, and whether married or single, date of graduation and where, and experience generally.”

THE men who succeed best in public life are those who take the risk of standing by their own convictions.

—Garfield.



Edgar D. Coolidge, D.D.S.
Chicago, Ill.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 5.

TORONTO, JUNE, 1915

No. 6

*Suggestions for Making the Dental Student a Better Student Dentist**

BY ARTHUR D. BLACK, A.M., M.D., D.D.S.

STUDY is the basis of professional progress. The preparation of this paper was undertaken with the special object of presenting a criticism of the work of our dental schools and of making suggestions pointing toward the development of better students, both before and after graduation. It is our duty to first pay our respects to those men, from Hayden and Harris down to the present day, who have contributed to the wonderful progress which has been made in dental education. Therefore, while we shall to-day suggest the abandonment of certain methods in vogue for many years, this is done, not as a reflection upon the men of the past, but rather as a compliment to their work in preparing the foundation which to-day makes further advance possible.

The dental practitioner of to-day is, with a few exceptions, the product of our present system of education. May we not scrutinize him and find some basis for changes in school methods which will tend to make the future practitioner more what we would wish him to be? May we include in this study a consideration of the newer problems which confront the dentist of to-day? What indication is there in these for changes in methods of teaching?

*Read before American Institute of Dental Teachers, Ann Arbor, Mich., 1915.

An almost world-wide propaganda on oral hygiene has increased enormously the demand for dental service. The outcry of Hunter against oral sepsis has brought the medical profession to a realization that mouth conditions are responsible for many serious secondary lesions, together with a demand for dental service of a higher type, which requires men of broader and better education. In considering the principal objective which our schools should have—of preparing men to best serve the dental needs of our people—we are confronted with the urgent need for more dentists and an almost imperative demand for better educated men. In determining upon the course to be pursued, we should not overlook the fact that the men graduated to-day must not only meet the problems which now confront dentistry, but also solve those more intricate questions which are certain to be present in future years.

We must realize that the dentist graduated to-day without having been taught to study, will not be equipped to keep pace with the progress of events; he will be no better dentist ten, fifteen or twenty years hence than he is the day he graduates, and I fear that many will retrograde rather than progress. The development of the habit of study is the most important training that can be given in the dental college course. It is of much less importance *what* a man learns in dental school than *how* he learns. If we could teach all of our students how to study, it would not make very much difference what they knew of dentistry when they graduated, as they would be so trained that they could master the problems which confront them.

Our present graduates are generally not the type that can handle the problems of the future with the greatest credit to the profession. Our dental schools have now about recovered in the number of students from the advanced requirements established in 1907. Are we to answer the call for an increased number of graduates of the present type, or shall we undertake, at some reduction for a time in the number, to prepare men who will be more nearly able and more inclined to develop a dental service which will best protect the health of our people and win for us the confidence of the medical profession.

The startling revelations of the past few years establishing the interdependence of mouth and general systemic conditions have served to impress prominently the need for dentists of broader education. We certainly should have the same mental grasp of the activities of the human organism in health and disease as do the men practicing

many of the other specialties. The dental profession is to-day unable to comprehend the studies of medical men as they relate to our special branch which appear in the literature of the past few years, because they have not had the training in study necessary for this purpose. There is ample evidence of a lack of ability to select and use the essential facts in dental literature, without considering the more complex problems involving the dental field with which the medical profession is now so much concerned. These require a broader and more thorough knowledge of the foundation studies upon which medicine rests. According to announcements of our various dental schools, we are teaching these subjects, but we must admit that the dental student has not been sufficiently impressed with his need for this knowledge after he graduates.

We must develop a new type of dentist. There must be a new dentistry, just the same as there has been in process of development a new medicine. The new dentist must be essentially and especially a man who thinks; whose principle service will be mental, rather than mechanical. The most important change in our teaching must be that which will train our men to think, to study, to analyze, to compare and to draw proper deductions.

There are presented two lines for improvement:

1. In the men who enter the schools, controlled by the entrance requirement and its enforcement.
2. In the training during the school course.

There is no argument of the general proposition that the better educated the man before he enters the professional school, the better student will he be. Men with a full college training would undoubtedly be preferable to men who have had only a high school education. In whatever proportion college training might be added to the entrance requirement will the type of student be improved. Unfortunately, conditions seem to be such that it is impractical to advance our entrance requirement to even one year of college work at the present time, as the reduction in the number of students would be too great. A closer definition of the present entrance requirement, with certain units specified as obligatory, together with a more rigid enforcement, will improve the general average of matriculants.

It is fair to presume that we are getting a different type of high school graduate in the dental school as compared with those who enter medical school. The medical students are, as a class, men who are anticipating a considerable book training, while those who choose dentistry are more

mechanically inclined, and look with disfavor upon those courses which require long hours with text books. This is in a large measure due to the influence of present dental practitioners. Those who commonly advise the young man to go to dental school, also impress very strongly upon him the utter foolishness of spending several hundreds of hours in the study of anatomy, histology, chemistry, general pathology, etc. Not until the rank and file of the dental profession have come to realize the need of the broader education will the majority of matriculants in dental schools come without prejudice against such studies. Therefore, we should use our influence at every opportunity to change the attitude of the profession in this respect. It would seem that the type of man who presents at the dental threshold is not susceptible of a sudden change, but that he can only be improved very gradually as a natural process of evolution.

If it is necessary that we continue with the present entrance requirement, we may improve the school product by more effective teaching, by lengthening the course, or by both. Teaching may be made more effective as the teachers are more interested and earnest in the work assigned to them. There is doubtless room for much improvement in every school in this respect.

The most important change herein suggested is the substitution of a recitation system of teaching for the present lecture and quizz plan. The larger the school, the more beneficial will be the change, yet it seems to be the most needed change for all schools. The possibility of such a plan has come to us only within the past few years, as the number and quality of our text books for dental subjects have increased. The recitation plan is necessarily based on text books for each branch which cover the subject in a manner satisfactory to the head of the department; so that he may consider the students' knowledge of the subject sufficient for the school requirement when the contents of the book have been reasonably well mastered.

Then for all schools, no matter what the number of students, each class should be divided into sections of twenty or twenty-five, and instead of lectures, an equal number of recitation hours should be scheduled for each section. The course for the entire year should be definitely planned, the subjects being divided into the proper number of hours. Accurate records should be kept of both the attendance and recitations of each student, and promotion should be based principally on this record. A series of written quizzes and

mid-term and final examinations should supplement the recitations.

Under the *present* lecture and quiz system, the student may learn little or much as he may be inclined, and yet pass the examinations by a few days of cramming, possibly with only quiz compends. In a quiz of an entire class of fifty or more the chance of not being called upon will be taken by most students too often for their own good. Real study, if we may call it such, is likely to be limited to a few weeks of each year.

Under the recitation plan, with sections of twenty or twenty-five men, each student will be practically certain beforehand that he will be called upon at every recitation hour. He also knows that promotion depends on his attendance and recitation record, consequently he must be with his books practically every evening if he is to earn promotion.

The most important advantage of this change should be the effect in developing the future student dentist. If a man is trained during three or four years to get his knowledge from books; to spend his evenings with them, to have them for his constant companions, instead of having all of his information poured in from a rostrum, or crammed in under examination pressure, he will have learned to depend on books, and will be more likely to use them in the future.

The substitution of this recitation plan by the small school presents few difficulties. The larger the school, the greater is the problem of securing qualified teachers. In the larger schools it would probably be out of the question for most teachers to increase the time devoted to school work sufficiently to hear each section personally. They would necessarily superintend the teaching and rely upon associates to assist with the recitations. However, it seems likely that we might attract a better class of men for this service than has generally been possible for demonstrators, as the hours need conflict very little with office practice. One could hear two recitations before ten or ten-thirty in the morning, or after three-thirty or four o'clock in the afternoon, and the college connection, together with the remuneration which might be paid, should be sufficient to attract good men. For foundation branches, it is probable that a considerable number of senior medical students or recent medical graduates would serve very satisfactorily.

This change is suggested with a full appreciation of the magnetism and eloquence of a limited number of men who seem to have been created with the ability to command and hold the attention of an audience under almost any condi-

tions. A school should not deprive its students of the valuable teaching of such a man, but let not too many of us think that we have this power. Neither is it desirable that a class, as such, should lose its identity. A schedule may be so arranged that the bulk of the teaching will be by recitation in small sections, yet permit of lectures to the entire class as may seem desirable in each subject. The determination in this should be based on the conditions surrounding each subject in the particular school. In some subjects one lecture a month might be given, in others no lectures at all. Some subjects may be best taught almost entirely in the laboratory. As a general rule, however, the head of the department should meet one section of the class, while his associates meet other sections, and there should be a regular progression, so that each student would have an equal number of hours with each teacher.

There is another very advantageous feature of this plan: That there would be one or several men in training in each department who would have earned promotion when a vacancy might present.

The same principle should be applied to laboratory instruction, the sections being as small as can be arranged. A thoroughly equipped laboratory, which will accommodate a small section, will afford the opportunity for more effective instruction than will be possible with a large section, even though the number of instructors be in the same proportion to the number of students.

The sectional plan in both recitation and laboratory permits the arrangement of a more elastic schedule; it also makes it possible to utilize the building space to better advantage. There may be recitations in the same subjects at different hours, or on different days, but in regular order, giving the opportunity to vary the schedule of individual students to meet unusual conditions. This would apply especially to students who transfer from one school to another, or to cases in which a student is required to repeat a single subject in which he may have failed and which might otherwise interfere with his advanced schedule. In many schools, certain large laboratories are used but two or three half days per week. With the sectional plan, the small laboratory may be in use practically all the time. It makes it possible to teach more thoroughly a larger number of students in a building of a given size, but will undoubtedly materially increase the cost of the instruction.

In clinical instruction, every effort should be made to secure the highest possible efficiency in team work between

the head of the department, his recitation assistants, and the demonstrators. The central idea in this should be to tie everyone connected with each department to the chosen text covering clinical procedures, and to insist upon the utmost respect from teachers in all other clinical departments. Each assistant should be impressed with the necessity of subordinating his personal ideas to those of the head of the department. Such team work is absolutely essential to effective instruction. If the requirement in each clinical subject could be the completion of a certain minimum number of operations of a specified grade of excellence, without setting a maximum, the general average of quality should be materially improved.

If it were possible to have the recitation masters in clinical subjects also act as demonstrators, it would seem to be an ideal plan, but I think this will generally be found to be impracticable. While there are some very notable exceptions, the man who is willing to take as much time from his practice as would be required for both recitation and demonstrator service, would generally not be desirable.

Careful study should be made of the proper balance of technical work to study hours. The present schedules of many dental schools are entirely too heavy to give students sufficient hours for study and reflection. Much time is wasted as a result of insufficient instruction in laboratory and clinic. If the laboratories can be well equipped for small sections, with better instruction, the time now provided in the schedule may be materially reduced, while the amount and quality of work will not be diminished.

Every conceivable plan should be undertaken to interest students in independent reading; to familiarize them with dental and medical literature. Ample space should be devoted to a reading room and every effort should be made to build up a good library and museum. The student is likely to be impressed with the importance of books and study in accordance with the space and convenience provided. The leading dental journals and several of the better medical journals should be available on the library tables. Students should not only be encouraged, but required to do reading outside of the regular school courses. Several chairs may call for short theses on assigned subjects. This year our former short course of lectures on dental history has been expanded into a lecture a week during one semester on dental literature and history, in which the writings on various subjects, as well as the contributions of selected men, will

be reviewed. This is a new feature which we believe to be very much worth while.

It seems to be the concensus of opinion that dental schools will require a four year course in the near future. There is much diversity of opinion as to the best curriculum for such a course. This is due in considerable part to the conditions in which each school finds itself. A few seem to desire the addition of a full college year to precede the present dental course, while many prefer the addition to the present course of a full year in dental subjects. I will present the view of the faculty of which I am a member, with the expectation that other plans will be presented in the discussion.

Our preference lies in what, for want of a better name, we have called the split course, to consist of a four year dental course, into the first two years of which will be incorporated the studies of the first year of the College of Liberal Arts.

Under this plan we would accept students for a four year dental course, with the present preliminary qualification of high school graduation. Freshmen would spend four half days each week in the College of Liberal Arts, and would have English and mathematics (or a science) as their principal studies. In the dental school they would devote the remainder of their time to basic studies for medicine and dentistry, with one dental technical subject, such as a recitation and laboratory period in operative or prosthetic technics.

Sophomores would also spend four half days each week in the College of Liberal Arts, taking a language and a science as their principal studies. In the dental school the basic studies would be for the most part completed, and a single technical recitation and laboratory course in dentistry would be given.

The Junior and Senior years would be much the same as at present.

Stated differently, the freshman year of the present three year course would be divided, and half of it would be given in the freshman and half in the sophomore year. The freshman year of the College of Liberal Arts would be similarly divided and the dental students would take half of it during their freshman and half during their sophomore year. There seems to be several points of advantage in this plan. The dental student would have training by the teachers and association with the students in the department of liberal arts during two years and would complete the full

freshman requirement in the college. During both years he would receive training in dental technic and would thus be developing in finger skill. This feature would be a distinct advantage of this plan over that in which a year of college might be required for entrance. The time now devoted to basic studies could be extended sufficiently to materially increase the teaching of these, making them closely if not fully parallel with the same courses in the Medical School.

It is believed that the plan suggested for the first two years will eliminate a number of students now entering dental schools, because they would find the study requirement too heavy or incompatible with their preconceived ideas that dentistry is mostly mechanical. The men who will satisfactorily complete these two years will, as a result of this training, approach the more strictly dental subjects of the following years with the expectation that much study will be required; they will have learned to depend on books in school work and will be more likely to do so in future practice.

The expansion of the present dental course over four years would tend to bring about little change in the type of student or in his viewpoint of the dental school and the profession. If we can not have a different type of matriculant, he must undergo a metamorphosis during the dental course, and it is felt that the year of college given as a part of the dental course, will be even more advantageous than a year of college as a preliminary requirement.

It seems hardly necessary to mention the fact that there would be little reduction in the number of students under this plan—the entrance requirement being the same as now—as compared with the proposition of requiring a year of college preceding the dental course.

As has been suggested, the conditions confronting each school will modify the course which it will prefer. The split course proposed, will be more acceptable to a dental school situated on the same campus with a liberal arts department, than to a dental school situated possibly in a different city, or having no university connection. It is believed that most schools could arrange to meet such requirement without too much inconvenience to their students.

It is hardly within the scope of this paper to discuss regulations, but there is such a close relationship between schedule and the regulation or law which may govern some of the schools in the near future that a suggestion may not be out of place. A four year dental course should be required, which will specify a schedule of a minimum number

of hours for each of the various subjects, also that a certain minimum number of these hours or subjects must be given during each of the four years. Such a rule would give each school some latitude in the matter of adding strictly dental or liberal arts courses to the present schedule.

We should look forward to the day when dentistry will become in the fullest sense a specialty of medicine. It seems very probable that there will be a change in medical instruction by which a definite general course will be required previous to schools or courses in each specialty. It is to be hoped that by the time of such change the teaching of the basic studies in our dental schools will be so nearly the equal of that in medical schools that we can discontinue the teaching of these studies in dental schools and stand with the other specialty schools ready to receive all of our students from among those who have had the general medical training. We will then have better dental students and better student dentists.

Meeting of Board of Directors Royal College of Dental Surgeons of Ontario

THE meeting of the newly-elected Board of Directors of the Royal College of Dental Surgeons of Ontario was called for Monday, April 26th, 1915, in the College Building. This date was one week earlier than usual, owing to a disarrangement of the progress of all schools associated with the University as a result of the organization of the Officers' Training Corps and the necessary training camp at Niagara necessitating holding examinations one week earlier.

There were present: Drs. Clark, McGuire, Abbott, Trotter, Willmott and Davy.

Dr. C. E. Sale, representative from District No. 6, who has volunteered for active service overseas and is now in military training, was absent from the meetings during all the sessions.

ELECTION OF OFFICERS.

The election of officers resulted as follows: President, Dr. W. C. Davy, Morrisburg; Vice-President, Dr. W. M. McGuire, Waterford; Registrar, Dr. M. A. Morrison, Peterboro; Treasurer, Dr. W. C. Trotter, Toronto; Secretary, Dr. J. B. Willmott, Toronto; Assistant Secretary, Dr. W. E. Willmott, Toronto.

It was decided to grant Dr. Cummer the use of the College Building, without charge, for Post-graduate Prosthetic Technique Course, to be given in the month of August, 1915; Dr. Cummer to reimburse the College for any injury to building or fixtures and to pay the janitor \$10.00 for extra services.

The Building Committee reported upon arrangements which were carried out in connection with the building extension during 1914. The cost, including architect's fees and extras, was \$2,796.77.

DENTAL ACT AND BY-LAWS.

It was decided to issue a new edition of the Dentistry Act and By-laws of the Royal College of Dental Surgeons. For this purpose the Secretary was asked to consolidate all amendments which have been made to the By-laws as now published, and have a new edition of By-laws issued as soon as convenient.

EXTENSION TO THE BUILDING.

Three resolutions were adopted regarding the building of a new wing to the College:

First—That in the opinion of the Board it is necessary, in view of the probability of larger classes in the immediate future, to proceed to the enlargement of the present building by building up the north wing on a foundation approximately 53 ft. x 68 ft., to the full height of the present building.

Second—That, as the registration for Session of 1915-16, when completed, shows a considerable increase in the Freshman, Sophomore, and Junior years, the present Building Committee—Drs. Willmott, Trotter and Seccombe, with power to add to their number—be and are hereby directed to secure plans and specifications from the architects, Messrs. Burke, Horwood & White, and to call for tenders for the proposed addition to the College Building; that, when ready, a Special Meeting of the Board be held to consider the report of the Committee, and if desirable to award the contract.

Third—That the tenders be asked for on the conditions that work be commenced not later than March 1st, 1916, and be fully completed not later than Nov. 1st, 1916, and that tenders be called for sufficiently early to permit of the completion of the work by this date.

It was subsequently decided that no definite steps be

taken regarding new wing until after the opening of the next session.

CALENDAR FOR 1915-16.

The following Calendar was adopted for 1915-16:

1915.

- Sept. 27—Written Supplemental Examinations, commence at 9 a.m.
- Sept. 27, 28, 29—Students registered by the Dean, from 10.00 a.m. to 1.00 p.m., from 2.30 p.m. to 5.00 p.m., and fees received at the College Office.
- Sept. 28—The Dean will meet the Freshmen Class, for explanation and direction, in Lecture Room No. 1, at 5.00 p.m.
- Sept. 29—The regular work of the Session, all the years, commences at 8.30 a.m.
- Sept. 29—Registration of students completed.
- Dec. 22—Term examination in each year.
- Dec. 23—Christmas Recess, commences at 5.00 p.m.

1916.

- Jan. 5—Term Examination in each year commences at 9.00 a.m.
- Jan. 6—Lectures in all the years resumed at 8.30 a.m.
- April 22—Annual Examinations commence.
- April 29—Examinations over.
- May 1—Board of Directors meet.
- May 4—Commencement.

STUDENTS' CLASS FEE.

It was decided that the Students' Class fee be increased from \$4.00 to \$6.00, the additional \$2.00 to be paid to the University Students' Council, and for which all students at the R. C. D. S. shall receive a copy of the University paper, *Varsity*, each year, and in their final year shall receive a copy of *Torontonensis*.

PHYSICS IN THE R. C. D. S.

The Report of the Faculty Committee on Physics was presented by Dr. W. E. Cummer, and contained the following recommendations:

First—The subject of Physics be taught in the Dental College.

Second—A Physicist be appointed, with a duty of 50 hours' didactic teaching and 50 laboratory hours.

Third—That the course be given to the students of the third year. That the balance of the time-table be main-

tained by moving Physiology from the second and third to the first and second years.

Fourth—An appropriation of \$400.00 be made for apparatus and the equipment of an Applied Physics Laboratory with temporary, and later permanent, quarters of a suitable character for this department.

The Secretary was instructed to notify the University of this change, and to express the appreciation of the College of the opportunity which R. C. D. S. students have had of benefiting by the complete equipment of the Department of Physics and of the courtesy of Professor McLellan and of his staff during the years that Dental Freshmen have been attending their classes.

In view of the proposed enlargement of the College Building, it is hoped that the College will be able to resume the teaching of Physics session 1916-17 to the third year class, having especially in view the presentation of the subject both from the rostrum and in the laboratory in its practical application to the practice of dentistry.

CLINICAL BOARD OF EXAMINERS.

There is to be a Clinical Board of Examiners, composed of the professors of dental subjects and the clinical staff, who shall decide the clinical requirements and report to the Faculty Council upon the standing of each student in Clinical Dentistry. The University to be asked to accept this Board in lieu of present examiners.

ESTABLISHMENT OF COLLEGE FELLOWSHIP (\$500.00).

It was decided:

First—That, for the encouragement of the Graduating Class, a Fellowship be established upon the basis of a remuneration of \$500.00 for whole time service for year following graduation, as assistant in the College Laboratories and Infirmary.

Second—That if, in the opinion of the Board, the year's work is satisfactory, and upon recommendation of the Professor in the Department, and of the Faculty Council, the Board will grant the Fellow a certificate of having completed one year of post-graduate work in the School of Dentistry of the Royal College of Dental Surgeons of Ontario. It was decided that Dr. Box, who was Fellow last year, receive such certificate.

DEPARTMENT OF MEDICINE AND SURGERY.

During the past session there was developed in connection with the new Pathological Laboratory and the College

Infirmary certain clinical work which has come to be known as the Department of Physical Diagnosis. The object of the work is to show the relationship between Oral Sepsis conditions and General Disease.

It was decided:

First—That as Physical Diagnosis is already included in the work of the Department of Surgery and Medicine, that Dr. E. Stanley Ryerson be asked to hold sufficient clinics in the College (say, one each alternate week during the session) to better develop instruction in Clinical Medicine.

Second—That Dr. Box, in conjunction with Dr. Webster, arrange clinics for the different professors in whose department would fall the treatment of the local condition in the mouth, and that a record be kept of the physical examination as well as the clinical history.

ADDITIONS TO THE STAFF.

Dr. H. K. Box was appointed Lecturer in Pathology and Demonstrator in Bacteriology, and Dr. N. T. McLaurin Demonstrator in Histology.

TREASURER'S REPORT.

Dr. W. C. Trotter, the Treasurer of the Board, presented his annual report, which showed the satisfactory balance of \$11,796.92. The total amount of licentiates' fees now in arrears of payment amount to about \$425. The Treasurer of the Board is to be congratulated upon the energy which has been shown in the collection of arrears of fees.

PROFESSOR OF DENTAL ANATOMY AND COMPARATIVE DENTAL ANATOMY.

Dr. R. D. Thornton was appointed Professor of Dental Anatomy and Comparative Dental Anatomy, as successor to the late Dr. W. H. Doherty.

THE COMMITTEE ON FITTINGS AND EQUIPMENT.

Drs. Secombe, J. B. Willmott and Trotter were appointed a Committee on Fittings and Equipment, with power to act.

The Board adjourned on Friday, April 30th, 1915, at 5.00 p.m.

Ontario Dental Society

THE Forty-eighth Meeting of the Ontario Dental Society was called to order by the President, Dr. C. A. Snell, on May 10th, 1915, in the city of Toronto.

Dr. Greene, in the absence of the Vice-President, took the chair while the President's address was read.

The Report of the Committee on Re-organization was adopted, as follows:

- (1) To discontinue the office of District Representatives.
- (2) The Presidents of the different local societies shall be Vice-Presidents of the Ontario Dental Society.
- (3) All such affiliated societies must be organized for regular and practical work, and the Programme committee shall have power to accept or reject any organization, subject to appeal to the whole Society.
- (4) All the Vice-Presidents, with any others chosen by the Society, shall be considered in nomination for the office of President.
- (5) Every member of a local society submitting the necessary credentials to the Treasurer of the Ontario Society shall be admitted a member at half the regular fee, except in the case of members of the local society of the city in which the General Meeting is being held.
- (6) The local societies furnishing essayists or clinicians for the General Meeting shall be so credited in the printed programme.
- (7) The Programme Committee is authorized to so amend the Constitution as to conform to these changes.

Dr. J. A. Armstrong, of Ottawa, reported on the status of the Canadian Army Dental Corps.

Dr. Coghlan moved, seconded by Dr. Cowan, and carried, that the commendation of the Society be extended to the Honorable the Minister of Militia and Defence for the establishment of the Canadian Army Dental Corps (Overseas Service) as a separate unit; and that we further extend our appreciation and endorsement to the Government for authorizing the corps. We also pledge our united support to the gentleman who has been called upon to organize and command the Canadian Army Dental Corps.

The usual grant of \$150 was given to the Oral Hygiene Committee of the O. D. S. for the work of the coming year.

The election of officers resulted as follows:

President—Dr. McElhinney, of Ottawa.

Secretary—Dr. R. D. Thornton, Toronto.

Treasurer—Dr. A. W. Ellis, Toronto.

The Programme Committee for 1916—Drs. W. B. T. Amy, G. G. Hume, C. R. Minns, W. G. Trelford, T. W. Dawson, D. J. Bagshaw.

The Programme Committee for 1917 (the fiftieth anniversary of the Society)—Drs. W. E. Willmott, R. G. McLaughlin, G. S. Cæser, J. A. Bothwell.

Oral Hygiene Committee—Drs. W. C. Trotter, R. G. McLaughlin, H. E. Eaton, W. Seccombe, R. J. Reade.

“A Vote of Thanks”

THE Ontario Dental Convention Meeting for 1915 has come and gone. The officers and committees are to be congratulated upon the excellence of the meeting and the splendid arrangements, so perfectly made and so well carried out. Though the formality of a “vote of thanks” was dispensed with, members of the profession are none the less grateful for the service rendered by the Convention Committees, and fully appreciate the personal sacrifices which that service entailed.

Appointments to Canadian Army Dental Corps

THE following appointments have been made to the Canadian Army Dental Corps for Overseas Service:

Lieut.-Colonel—J. A. Armstrong, Chief of Dental Services.

Majors—O. K. Gibson, J. S. Ibbotson.

Captains—A. A. Smith, W. B. Clayton, V. C. Mulvey, W. G. Thompson, J. E. Holmes, W. J. Bentley, W. R. Greene, A. E. Mullin, G. Gow, G. N. Briggs, L. N. Trudeau, A. Stevenson, G. S. Cameron, O. A. Elliott, C. E. Brown, J. F. Blair, B. L. Neilly, H. M. Little, F. R. Mallory.

Lieutenants—F. W. B. Kelly, O. G. Hassard, B. Cartwright, A. E. Thornton, Jr., J. Roy, E. Kelly, G. V. Morton, C. E. McLaughlin, H. P. Thompson, H. Jackson, J. W. Hagey, E. W. Honsinger, H. Ross, H. F. Alford, G. Atkinson, A. L. Chappell, H. Clarke, A. R. Currie, H. Gagnon, R. Jamieson, J. L. Kappele, O. Leslie, W. G. MacNevin, P. E. Picotte, J. Roberts, H. P. Travers, F. L. Williamson, D. D. Wilson, G. H. Fowler.

Factors of Importance in the Construction of Cast Gold Inlays

(Continued from last issue)

It may be noted that Dr. Price is discussing "Factors of error in the Taggart direct method." First, he points out that wax shrinks when placed into the cavity, but does not point out that the shrinkage is corrected at the margins by the carving. Second, he points out the elasticity of the wax, and implies that a wax that has been stretched again returns to its original form during the construction of the inlay, apparently not recognizing the fact that some of the profession's best technicians are using the water from the same glass to both chill the wax while carving it to carry the wax in from the cavity to the bench for investing immediately, and to mix the investing material with, thereby not getting a change in temperature of more than a degree or two before the investing material has hardened. Third, he mentions that investing materials properly made will expand approximately one per cent., but if of a poor quality will shrink about two per cent. It may be pointed out that the good ones will also contract rapidly if heated very long at a temperature of 850° F. or higher, hence the reason why Taggart has advocated from the beginning that the mold be removed from the heat as soon as it had the wax melted out of the way for the casting and had a sufficient dehydration to prevent much back pressure in the mold when the hot gold was forced into it. Fourth, he mentions that some investing compounds are distorted when the gold is forced into them, and says that this gives an error that is not uniform expansion. From the beginning Taggart has advocated a nicely regulated low pressure delivered quickly, a feature in which no other appliance to date can excel his. Fifth, he mentions that gold contracts on cooling, and suggests that it may be partially controlled by pressure on the gold during cooling, and by using a strong form, such as artificial stone, to cast the gold around.

That such errors as the ones mentioned might occur in the hands of a bungling technician there is little doubt, but to call them "Factors of errors in the Taggart method," and suggest that it was necessary to use such radical technique as the artificial stone model, high pressures on the gold while cooling, and an expanded wax to correct them, certainly shows unfamiliarity with Taggart's methods.

Later in the same article and in various parts of the current literature reference is made to the change in volume of waxes which has been so thoroughly investigated by Dr. Price, and presented by him at various times, both orally and through the Dental Journals. The elasticity of wax has likewise been studied and reported in detail by him. A careful review of the articles referred to by Grievés in his report before the Sixth International Dental Congress, in Items of Interest for October, 1914, which includes many of the best ones, will show that many of the profession have encountered much of the trouble that is referred to by Dr. Price, but the writer is of the opinion that there must be some who have never encountered these troubles because their results cannot be excelled and they are not using the methods suggested by Drs. Price, Van Horn, Lane, and others relative to the use of hot molds or expanded waxes.

It seems safe to assert that no one can fail to acknowledge the debt of gratitude that is due those who present such detailed scientific data as has been presented by some of those mentioned relative to the behavior of the waxes, but it appears to the writer a mistake that the conclusions to be drawn from such research should have been made and advocated to busy practitioners of dentistry as the corrections for errors which had already been demonstrated unnecessary to exist.

Therefore, it seems unnecessary to consider the change in volume or the elasticity of the wax, if it is invested immediately and is transferred without change of temperature, unless the pattern is to be purposely expanded. The aim should be to avoid a change in temperature that would change the volume of the wax or release the tension placed on it when packing it. This seems to be the most valuable practical lesson to be drawn from the work of Dr. Price on waxes, viz., invest it immediately, not allowing it to change temperature from the carving to the investing. By obtaining a glass of water at room temperature and using this to cool and invest in as well as chill the water with, using a good-sized pellet of cotton for the purpose of chilling the wax, the process of carving and investing and carrying the pattern to the laboratory may be carried on without a perceptible change of temperature. As to the expanding of waxes for the purpose of enlarging the casting, it appears to be an unsafe procedure except when the wax is of a uniform thickness like it is in a few saddles for bridgework, etc. As a laboratory procedure, it appears more satisfac-

tory than when used in the mouth in the writer's hands. Any amount of releasing of the tension on the wax in the mouth that can be accomplished has not allowed the expansion of it afterwards to give a casting true to form.

In the production of the gold washer for the mandrel the expansion of the wax aids materially, but the patterns do not remain true to form when they are from some of the irregular cases that are found in a large clinic. These irregular expansions appear to be due to uneven density and thickness of the wax after packing into the cavity. Whatever be the cause, it does not appear as contributive to beautiful results in the great variety of cases that are found in a large clinic as does the close adherence to the technique previously mentioned.

Another subject which has been discussed by several writers is that of the temperature of the mold at the time of casting. An extended inquiry into the methods of a great many who have been known to be reasonably successful with this work has revealed that by far the greater number have favored what would generally be called a hot mold. This has been especially true with those who were using the vacuum principle for delivering the pressure. The opposite has been true with those who were skillful with the Taggart appliance, with one or two exceptions. The difference between the various machines in the market for the purpose of delivering pressure and the Taggart, is very apparent in at least two respects, viz., the Taggart has the most uniform pressure of any device that has been presented, and it permits of the quickest delivery of the pressure of any device yet offered to the profession. These two features, and especially the latter, permits of using a cold mold without having the gold solidify before it has reached the remote parts of the mold, which are usually acute angles made by the margins of the wax. With a device like most of the vacuum appliances the application to the molten gold is not to be compared in quickness of delivery, which with the Taggart appliance is done with a spat that is so quick that it is hardly visible. With a recently designed centrifugal appliance (see Cut No. 10) that has a straight arm with a shield to direct the gold toward the mold as the pressure is delivered, are more like that with Taggart appliance, though not quite as quickly nor uniformly. This device is sold by the Patterson-O'Brien Co. of St. Paul, Minnesota, and is capable of doing very good work if the principles involved in the delivery of pressure by the centrifugal method are taken into consideration. It is obvious that with

a vacuum appliance a cold mold will not do for many irregular castings with thin sharp margins, for the gold will never reach such places in the mold. With the gold lying directly over the sprue, as it does with the Taggart appliance, and

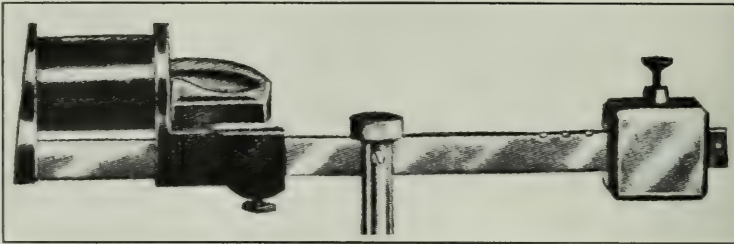


Fig. No. 10.

with the pressure applied with a spat, the gold can be carried to the finest edges in a mold that is at the freezing-point of water. with nearly all kinds of shapes of castings for inlays.

The possibilities of the two machines in this respect are as different as can be imagined. The centrifugal appliance referred to occupies a middle ground in this respect. The centrifugal appliances that have an arm with a joint that moves outward under varying conditions are not to be compared with the one referred to either, in this respect. It seems, therefore, that from the standpoint of the delivery of the pressure the cold mold is permissible only with the Taggart appliance and with the centrifugal appliance referred to, or one of the same type. Since more dehydration of the investing material aids in the passage of atmospheric air to the vacuum the hot mold would seem to be capable of aiding in the delivery of the pressure with the vacuum appliance. It seems clear why those using the vacuum appliance should use the hot mold, though it does not account for the use of the cold mold by those using other types of machines.

In 1908 the writer advocated a cool mold for casting, and pointed out in this connection that gold and other metals did not have the fixed contractions on cooling that were attributed to them only under fixed conditions. Excess of heat, shape of casting, combination with other materials, and a cool mold were pointed out as modifiers of the amount of contraction that would take place when the casting cooled down. Since that time several men have referred to the statement that a cool mold would produce a larger casting, and each one seems to have placed a different interpretation on the word larger. Apparently none of those who have

discussed the subject have tried the casting of gold into a cool or cold mold with an appliance that would carry the gold to the finest angles, and have taken the contraction that occurred in compound cavities, cast base crowns, etc., where the casting has three or four outside dimensions to fit, as the basis of their conclusion. There should be no trouble in observing that the distance from one cervical margin to another on a compound inlay is greater with the cool mold than with a hot one with the Taggart appliance and the pressure regulator set below six pounds. The best form to illustrate the difference seems to be a discoid with knifeblade shape (see Cut No. 11, also No. 12). In this casting, as with most large inlays, the shrinkage of the gold in a cold mold is represented by a hole in the casting in the locality of the sprue former or a sprue that is reduced in size or even disconnected from the casting when the Taggart appliance is used with low pressure and a sprue that is small enough to prevent a premature falling into the mold of the gold by any little jar that may be given the appliance at the time of casting. These sizes of the sprue vary from twenty to forty thousandths of an inch. With a

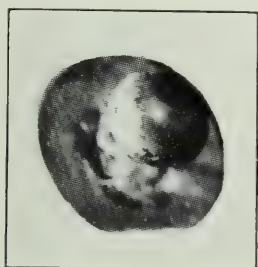


Fig. No. 11.

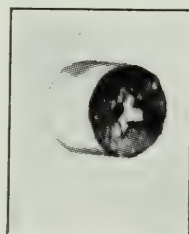


Fig. No. 12.

larger sprue and increased pressure, and with smaller castings, the metal is fed fast enough to prevent the formation of the hole in the casting and the shrinkage appears more uniformly distributed throughout the casting. A pressure, however, that will make sure the feeding of a casting the size of a large compound inlay in a molar with a cold mold will invariably distort the mold, the very thing that is aimed to prevent. If, on the other hand, the pressure is maintained and the sprue increased in size for the sake of feeding the cooling casting, the back pressure in the mold produced by the incoming hot gold causes the gold to return against the pressure of the machine. With the centrifugal principle shown in Cut No. 10 the sprue may be as large as eight-thousandths and the pressure increased according to the following formula $\frac{WV^2}{32.16R}$ many times that mentioned for

the Taggart appliance, and as a result the gold is held to the remote parts of the mold in most cases against the back pressure, and the casting is fed with molten gold as it contracts. Such castings, however, that are made with fine silica and plaster of paris investing materials that are now in the market will be untrue to form so often that the method, while it is in keeping with modern practice in allied casting work, must not be compared in accuracy of fit of the casting with castings made from low pressure.

Castings distorted from high pressure that are necessary to feed the molten gold during the cooling may sometimes be fitted to make a very acceptable result, but they must have the fitting. It must be remembered, however, that the feeding of a cooling casting requires heat, pressure and a sprue that does not cool at the same time that the remote part of the casting does, and by so doing shut off the feeding. The latter is what takes place with the use of the small sprue former and the low pressures usually used on the Taggart appliance, and the result is that the casting is not always fed and the shrinkage is often represented by a hole in the casting, a sprue that is reduced in size, or even disconnected from the casting because the gold is kept a little hotter at this point, due to the heat applied to the investing material in melting the gold, but is not in a condition to be fed to the casting below.

TWO KINDS OF CASTINGS.

Two kinds of castings appear as a result of the use of low pressures and small sprue formers, and high pressures and large sprue formers. The former may be known as those that are not always fed with molten metal, depending upon the size, shape, etc., of the filling, and the latter may be known as those that are fed with molten metal. With the former, fine margins which often determine linear dimensions, are often dependent upon a cold mold that will chill the metal instantly at the margins, thereby bringing into operation surface tension, which pulls the cooling metal from the centre towards the congealed margins before an appreciable amount of back pressure has had time to form from the hot gold.

With the latter fine margins may be produced with either a hot or a cold mold, though in the writer's hands there is little comparison between the castings made under low pressure and the one made under high pressure in any investing material now available, in accuracy of fit.

For this reason the low pressures and cool mold have

been adhered to with all our machines that would deliver the gold to remote parts of the mold into the finest margins before congealing, even though there was a hole in the casting, a defect easily corrected with a small piece of lower carat gold and a blowpipe.

A close study of the "Hadfield Process" of making sound steel ingots by Sir Robert Hadfield in the proceedings of the Iron and Steel Institute and the numerous references to the process by others, the practical suggestions by John Sharp and others, as well as a careful survey of the operations of the foundries where perfect castings are a necessity will, in the opinion of the writer, convince the present users of hot molds that the problem with a foundry man in most cases is, first, cool mold, and, second, facilities that will feed the molten metal to the casting as it tends to form the hole in the centre. Since the present investing materials do not seem to resist the pressure necessary to fill all shapes of castings without distortion of the mold, it appears that the better practice is to adhere to the cool mold for the cast inlay where the fine margins and true form are the important features, and get a pressure appliance that will deliver the pressure quickly and uniformly allowing the hole to form in some of the castings rather than attempt to feed it.

With castings other than the inlay, where the fine margin is not so important a feature, a warmer mold may be permissible, but in no instance does it seem that the quality of the casting nor the trueness to the form of pattern is improved as a result of the increased heat. Until dentists adopt the use of pressure appliances that are capable of filling a cool or cold mold for a compound molar inlay to the finest angles, quickly, and with uniform low pressure, they will not realize to the fullest extent what a perfect reproduction of a wax pattern is.

There are in the market a few investing materials that will not permit of the use of the cool or cold mold in the writer's hands with any pressure appliance yet devised. Upon examination it has been found that the difficulty lies in the lack of porosity of these products. No amount of pressure obtainable with any of the devices tried would result in the fine margins that could be obtained with other materials. Not only have these materials been the cause of failure in our hands when used comparatively cold, but have done the same when heated thoroughly. This lack of porosity of these products seems to cause the air to become compressed as the gold rushes into the mold, and, prevent the escape of the gas formed from the hot gold.

The introduction of such materials as clay, magnesia, whiting and other materials that will get more dense with heat, are contributing factors, if not controlling ones, in the cause of the density of these materials. An investing material must allow air and gases formed from the hot gold to pass out readily if the gold is to reach and be held in the finest margins. While clay and magnesia both add to the strength of most of these investing materials, as their setting qualities are added to those of plaster, they both shrink under comparatively low heat and make an investing material that is very dense and hard as compared to one made from plaster alone as the binding material.

The writer pointed out in 1908 that the only material then available that could be depended upon to expand regularly upon the application of heat, and thereby counteract to a great extent the shrinkage of the plaster, was silica. It was also pointed out that two or three grades of sizes of silica would eliminate much of the tendency of these materials to crack, because there would be an overlapping of the different-sized particles. From that time until now there has been little improvement in the material suggested at that time for inlay work either by the manufacturers or by anyone else. There has been a tendency by the manufacturers to adopt the use of a coarse grade of silica that had round particles instead of the No. 200 flint suggested. This appears as a little improvement over the angular Flint suggested at that time.

Two or three grades of silica, with the finer grade predominating, together with plaster of paris, in the proportions of approximately four of silica and one of plaster, as adopted by the majority of the manufacturers at that time, will permit the use of a cool mold and the pressure devices that are quickest in their delivery of the pressure. Those containing the materials suggested that set or bake hard, however, seem to have no advantage except strength, which seems to be insufficient in importance to counterbalance the objection that they have of not being porous enough.

*The Recognition of Systemic Disturbances in the Treatment of Oral Lesions**

BY B. H. TEAGUE, D.D.S., AIKEN, S.C.

THE practice of dentistry is the exercise of dental art, and embraces all that pertains to the knowledge of, prevention and cure of the diseases which the dentist is called on to treat"—to paraphrase the introductory assertion of the author of a medical work. "Disease may be defined as any departure from the normal standards of structure or function of an organ or tissue or both combined." (Hughes.)

The diseases that dentists are called on to treat are oral lesions, and are generally of toxic origin, either local or systemic, and the treatment given them is usually solely topical. Nature, in great part through *vis vitae* and patience, accomplishes a cure, when adjuvant systemic treatment would have accelerated her strenuous efforts toward that end.

ALVEOLAR ABSCESS. ADJUVANT SYSTEMIC TREATMENT.

Alveolar abscess, the most frequent of the oral lesions that require attention, in its incipient stage—viz., that of peridental inflammation—is most readily aborted by opening the septicallly surcharged tooth which is the focus, irrigating it with a germicidal wash, cleansing it of bacterial matter, and filling the roots and crown with antiseptic material, either temporarily or permanently as the case demands, and then by applying counter-irritants to the adjacent gums. If the patient's system, however, is in a bilious condition, the heroic method of surgical perforation of the alveolar plate, reaching the inflamed point, and bloodletting, is absolutely necessary for quick relief. This systemic condition should always be diagnosed, and when it is confirmed, the patient should be put upon a course of systemic medication conjointly with the topical treatment. If neurasthenia exists, and the patient's vital force is low, it will be found that the case will not readily yield to alleviatory measures. The general nervous system then should be attended to and toned up. A cure is especially difficult when

*Read before the South Carolina State Dental Association, and published concurrently in *Dental Cosmos* and ORAL HEALTH by courtesy of Dr. E. C. Kirk.

the patient is affected with disease of the kidneys. In chronic diabetes, particularly, the family physician should be called to consult with the dentist. In this dyscrasia the capillaries are sluggish and inert in disposing of the effete blood at the focal point; congestion takes place, and pus rapidly forms. The system is so charged with toxins uneliminated by the weakened kidneys that the offending tooth acts as "a splinter to the flesh," and in spite of all remedial efforts, extraction in the majority of instances is to be resorted to, to prevent toxemia.

OTHER ORAL CONDITIONS REQUIRING PRELIMINARY SYSTEMIC TREATMENT.

It is in this condition of dyscrasia that a blind abscess evolves into the active stage. In this condition, moreover, local as well as reflex neuralgia occurs, severely at times, in the treatment of septic roots of teeth, in the extraction of semi-devitalized pulps from tooth-roots, and in the insertion of pivot teeth. The slightest impingement on or disturbance of the end of the connecting nerve to a tooth or those in the tissues adjacent to the end of the tooth is sufficient to cause nervous derangement. This condition of the system should be recognized in the treatment of such forms of stomatitis as the aphthous catarrhal—salivation—gangrenous—*cancrum oris*—and ulcerative; particularly in *pyorrhea alveolaris*, hypertrophy of the gums, inflammation from the eruption of third molars, and irritation of the mucous membrane under artificial dentures; when hemophilia is suspected, when the gums are to be lanced or excised, and teeth are to be extracted. An alterative and tonic systemic course of treatment is here indicated before operations are performed, and a sedative course should be given in cases of excessive nervousness prior to sittings for the excavation of sensitive dentin, since it will be found that topical applications of anesthetics for the prevention of sensitiveness will be more effective, and the patient will also submit to strain better when previously prepared for it.

SYPHILIS.

That terrible, blighting scourge of humanity, syphilis, should be reckoned with more appreciatively by dentists than is generally the case. The symptoms of its three stages should be known, especially those of its secondary manifestation, for in this stage the danger of infection is greatest to the operator and through him to his patients. The markedly pitted and ill-shaped teeth of inherited syphilis are generally well known. In the treatment of *pyorrhea alveo-*

laris, systemic disorders must be considered most carefully. Dr. Baldwin and Dr. Larned in their brochure, "Syphilis in Dentistry," have this to say: "It was then that a more careful examination of the teeth of syphilitics was entered into, and the result was the finding of a comparatively large number of cases of pyorrhea alveolaris. Upon request, a number of dentists submitted cases. These were carefully questioned, and about two-thirds gave a history of syphilis. A sufficient number existed to classify them as cases of syphilis *ignorée*, or as old cases of tertiary syphilis in which there was only the bone symptom to be observed. However this may be, the subsequent treatment showed that the etiology had been correctly established." "The few observations made have shown a greater or lesser interdependence between syphilis and pyorrhea alveolaris."

SYSTEMIC DISEASES ASSOCIATED WITH PYORRHEA ALVEOLARIS.

"Is it not a curious coincidence that Riggs' disease should be observed in so many cases of secondary syphilis as well as the late form of this period? It must also be remarked that pyorrhea alveolaris occurs as a parasymphilitic phenomenon. When we take into consideration that the teeth are observed to be sound before syphilitic infection, and that after the disease has manifested itself it shows its presence; and, further, when systemic as well as local treatment directed to the syphilis causes both to disappear, we are justified in concluding that lues is a factor in the production of Riggs' disease."

Other dyscrasias must be thought of in the treatment of this malady. Tuberculosis, malaria, fevers, liver trouble, diabetes, gout, and rheumatism are to be considered as potent basic factors in the stubborn resistance to cure in spite of skilful instrumentation and intelligent application of topical medicaments.

Without doubt, many of the failures of successful treatment of pyorrhea alveolaris, assiduously attended to locally, are caused by neglect of the consideration of systemic conditions.

Hypertrophy of gum tissue, at times almost over-reaching the grinding surfaces of the teeth in its severity, is best treated by diagnosing the etiology of the disorder, and employing such general therapy as will accelerate the topical.

Irritation and inflammation are the characteristics of oral lesions that dentists have to treat, and in the main are reflexes and local manifestations of general systemic disturbances. In the practice of orthodontia it is well to recog-

nize the importance of keeping the general system in such healthy condition as to preclude nervous strain and shock. The same is to be said in the treatment of traumatic injuries of the jaws, fractures of the mandible, *et cetera*.

A PLEA FOR SYSTEMIC MEDICATION.

It may be argued that the busy dentist cannot undertake the systemic treatment of his patients, especially in chronic cases. This may be true as far as the majority of the profession is concerned, but to those who practise according to the full scientific light of the calling, it is only true in part. The dentist should be familiar with pathological conditions of the general system, and know when to advise general medical treatment to his patients by the hands of the physician, when he is confronted with a severe local lesion of a deranged system which is stubborn to cure. His should be the province to prescribe for simple derangements of the system such as biliousness, nervousness, and other temporary ailments.

We plead for more scientific study along these lines, and though we would not seek to minimize the artistic and technical phase in the practise of dentistry, yet dentistry being the connecting link between medicine and mechanics, this link should be made strong and perfect in all its parts.

Pyorrhea up to Date

T. B. HARTZELL, D.D.S., MINNEAPOLIS.

THE writer wishes to convey that he refers solely to pyorrhea treatment as it is accepted at the present time. The paper is written for the present only, as any time may change our belief regarding the treatment. Many men have attributed pyorrhea to specific micro-organisms, and it is unfortunate that they do not verify the theory. If the theory is true, the etiology of this disease would have been worked out to an absolute certainty long ago. The conclusion seems just that pyorrhea is primarily a bacterial disease, whether due to a single organism or not. The constant presence of micrococci and bacilli in great numbers, as well as other bacteria, in every pyorrheal condition, is a ground for assuming that bacteria are essential to this type of inflammation, and it is possible that the recent work of Hansen has proved the relationship between streptococci, staphylococci, pneumococci, and the bacilli commonly found in the lesions associated with the destruction of the alveolar process

The writer for many years believed that mechanical factors, such as malocclusion, were directly causative factors in this disease. He now thinks that malocclusion is not directly but indirectly a causative factor. It is not responsible for bone destruction to any great extent; malocclusion and all other types of mechanical imperfection, he holds, are only etiological factors in that they induce congestion of the tissues by mechanical irritation, so that the bacteria, always present, obtain an easy access to the tissues, whose resistive power has been diminished. The author finds an absolutely constant relation between the most heavily loaded, bacterial-bearing surfaces of the teeth and the occurrence of pyorrhea pockets. Mechanical imperfections in dentures, permitting the entrance of food under the gum margin or the injury of the gum margin, tend toward congestion and the preparation of the tissues for infection. If, however, soft tissues adjacent to the teeth are carefully kept so that they remain firm and elastic, the teeth being kept physically clean, comparatively little infection will occur. In this type of denture infection it is generally the interproximal tissues that suffer first, since the protected areas, where bacteria grow undisturbed, furnish the infection.

Pyorrhea treatment involves two general lines of attack. The first involves the tooth's surface both of crown and root. The second is to render immune the mouth conditions so that the mouth is less habitable for those common forms of organisms found in pyorrhea pockets, and this condition of immunity is brought about by encouraging the formation of immune bodies in the blood and saliva of all affected individuals. The first treatment is mechanical, consisting in polishing out the imbrication lines in the enamel, rendering the tooth less accessible to bacterial plaques and teaching the patient how to disclose and remove bacterial growths from the tooth's exposed and interproximal surfaces; then the root surface is removed. The author regards diet and auto-vaccination as important, and orders those foods which tend to a normally alkaline saliva, such as the fruit acids and vegetables. The exclusion of fruit acids and the large use of carbohydrate foods tend, he thinks, to produce acid salivary secretions. Nature attempts to wall off pyorrhea pockets by inflammatory exudations. Whenever there is sufficient vitality to withstand the constant absorption of toxins, leucomaines, and bacteria from the infected walled-off areas about the teeth, the patient may eventually be cured by the dropping out of the teeth. And it is noted that many people pass through periods of physical depression

during the loss of their teeth, who, subsequent to the loss, become comparatively well and strong again.

The most constantly reported organisms found in pyorrheal infections are first micrococci, diplococci, spirochetes, and many short bacilli. Naguchi, of the Rockefeller Institute, has been able to grow three families of spirochetes, none of which families are pathogenic, though an injection of one of them produces a cellulitis in the tissues of the monkey. Goadby describes a strepto-bacillus found in the mouth fluids, which organism the writer has been unable to demonstrate in any of his cases. The author finds, however, that the micrococcus grows plentifully in almost every case; he has demonstrated it in smears from the tissues as well as in those from the deeper root-surfaces and in smears and cultures made from root ends of abscessed teeth after extraction. Occasionally this organism will haemolyse blood; while in other cases what seems to be apparently the same organism will not haemolyse blood, though the same in other cultural characteristics. Thus far the organism is not pathogenic for rabbits, showing a rather low degree of virulence. This would be in keeping with the character of the ordinary pyorrheal inflammation, which seldom produces a virulent fulminating process. Rosenow has reported that it seems eminently probable that the diplococcus, so frequently found by Madalia, and the micrococci, staphylococci and streptococci may be all one type of organism, changing its character under varying cultural conditions and oxygen tension. Twice Rosenow has been able to transmute the *Streptococcus viridans* into a typical pneumococcus. The author quotes Rosenow's remarkable series of experiments. Rosenow says: "In order to change the characteristics it is necessary to place these organisms under stress or strain. This seems to call forth latent energies which do not manifest themselves under ordinary conditions. Of the many ways that have been tried to bring about important changes, the growth in symbiosis and other bacteria, especially *Bacillus subtilis*, on blood-agar plates, and growth under varying degrees of oxygen tension and variations in salt concentration, proved most effective. When haemolytic streptococci are grown under relatively low oxygen tension their haemolysing power is maintained; when grown in pure oxygen they lose this property gradually and become green, producing *S. viridans*. This fact would seem to explain why *S. viridans* predominates on the surface of normal or only moderately diseased tonsils and on other mucous membranes, when at the same time the crypts harbor haemolytic

streptococci in predominating numbers." Further, Professor Larson has, by appropriate means, changed the fusiform bacterium into a spirochete, while it has reverted to the bacillus form, and this explains the fact that we generally find the fusiform bacillus and spirochete growing together. Teeth afford ideal conditions for this transmutation.

The writer regards the most successful treatment to be: (1) determine by appropriate stain the nature of the bacteria on the tooth's surface; (2) remove by mechanical means the bacteria from the tooth's surface, at the same time rendering the tooth's surface brilliant and free from the etching caused by the acid of the *Bacillus acidi lactici*. He polishes the enamel, giving to it a high degree of brilliancy. The next step is the removal of the dead root surface, together with such calcific deposits as may have accumulated on the root's surface. This should be accomplished with a plane of self-limited cutting depth, so that the operator will not endanger infection of the bone cells or cementoblasts of the deeper layers of the cementum. This removes the primary focus of infection.

If the tooth is worth preserving the removal of the dead root surface makes possible the rapid filling of the space created by loss of bone and periodontal membrane fibre with new blood cells in a few hours. Since new bone arises from bone cells and not from periosteum, Professor Znamensky scrapes out the pockets with good results. Fletcher advises that the bone should be burred and curetted after pyorrhea treatment. Therefore, after surgery of the root surface has been properly accomplished, our next step is to bring about the conditions necessary to the development of new bone, which, in brief, are: (i.) freedom from pressure of surrounding soft tissues, (ii.) asepsis, (iii.) quiet, *i.e.*, immobility of the teeth themselves, and (iv.) exposure of new bone cells. Asepsis necessary to the growth of new bone is accomplished by perfect root surgery, *i.e.*, the removal of every vestige of dead infected material from the root, and the curetting of the process edge stimulates a fresh outpour of new bone cells, but not deep or vigorous cutting of bone, only a sufficient scraping or cutting of the bone edge of the process to expose healthy bone cells and promote free hemorrhage; this mechanically flushes bacteria out of the bone and tissues. (3) The protection of the new bone cells from pressure of the overlying soft parts by imprisoning, if possible, some of the blood clot which results from the curetting of the bony process, and, at the same time, avoid-

ance of massage of the gums as long as any new bony material is assumed to be present. (4) An aseptic field must be provided. (5) If the teeth have movement, they should be splinted together so as to render them immobile.

It is important to close the pockets to the fluids of the mouth. This can be approximated, however, by the use of such substances as will adhere to the soft tissues of the gum and the teeth. The author has been unable to find any substance which would maintain itself for any considerable period of time. The best that can be expected of any sealing solution in the mouth is but a few hours of use. These few hours are vastly important.

The substances he suggests are sandarac varnish, or a saturated solution of iodine in creosote, painted on the gum and tooth's root surface, and this latter solution is immediately followed by a saturated solution of tannic acid and glycerine. The iodine-tannic acid solution is the better because the iodine on the tooth's neck inhibits bacterial growth and forms a collodion-like film, closing the pocket against a bacterial incursion. If shrinkage of the newly filled in material occurs, the necks of the teeth may be again thoroughly cleansed and the newly formed tissue lightly curetted to fill the pocket with blood and again sealed. This can be repeated every third or fifth day in obstinate cases or as often as the operator thinks necessary. Where the vitality has been reduced and where the dominant organism in the pockets can be isolated and cultivated, a vaccine is made and employed to promote the patient's resistance to infection. The writer contends that the use of vaccine is not always necessary if the surgical treatment is properly carried out. The time permitted to elapse between each treatment should be sufficient to enable the individual to overcome the absorbed bacteria. He attaches importance to obtaining cultures and vaccines of the dominating form of bacteria, although he believes vaccines of those of a secondary importance are also worthy of a trial.—*The Dental Summary*.

Dr. J. B. Willmott, Dean of the Royal College of Dental Surgeons, has had a rather severe illness, but the profession will be glad to know that is progressing favorably and is well on the way to recovery.

Dental Department in American Field Ambulances

A MEDICAL correspondent of *The Times* has sent to that journal an interesting account of the "American Ambulance of Paris," which he describes as one of the best equipped and most remarkable war hospitals in Europe at the present time. It appears that in the treatment of the wounded at field or base hospitals in France the services of dental specialists have not so far been provided for in the organization of British or French Army Medical Corps. It is only during the past few years that the real value of skilled dental attention in ameliorating the condition of sick or wounded has been to any extent realized by the medical authorities. Following the more frequent co-operation between dental and medical men in civil hospitals, a wider significance is now attached to the importance of securing an aseptic field as a preliminary to all operations upon parts of the body exposed to the operations, the manipulative and therapeutic procedures which the routine of daily practice has made the dentist expert in have often proved helpful auxiliaries in cases involving larger issues and conditions.

The American Ambulance possesses a dental department, and the Paris correspondent above referred to is convinced that in this respect it has set a precedent of which every military hospital must presently take cognizance. He gives his testimony as an eye-witness of several instances wherein the practical value of skilled dental service to wounded men was demonstrated.

One was "a patient" whose jaw had been fractured in three places, and who had, at the same time, lost the crowns of three teeth. The exposed nerves in these teeth had caused him most exquisite suffering—so much, indeed, that the pain of the broken bones was scarcely noticed. It is a fortunate matter for this man that he had been brought to the American Ambulance.—*The Dental Record*.

Keeping the Toothbrush Clean

THE unsanitary condition of the average toothbrush is well known and admitted, but the extent to which the user will put up with it is usually governed more by a varying "niceness" in discrimination than by any fear of infection. Not many people take trouble to subject the toothbrush to a daily or even to a weekly sterilization.

A certain violent repugnance is an effective check upon the possible exchange of brushes by different users, and it would be a good thing if the same feeling could be excited against the careless laying down of brushes in close proximity or actual contact with one another. For under those conditions the toothbrush may become a carrier and spreader of infections.

A city health department has now suggested that for school or institutional use a simple and inexpensive outfit could be made from a glass test-tube about one inch in diameter and seven inches long.

The instructions issued are as follows: Place cotton (for saturation) in the bottom of the tube and fit a tight cork into the open end of the tube. The brush may be placed in the tube, the bristles in contact with formalin-saturated cotton, or it may be suspended from a hook attached to the inner end of the cork. On removal of a brush from these replacing it in the container give it another thorough washing. Brushes so kept will not only be sterile, but will have a refreshing odor and will retain a desired firmness of the bristles for a longer period of time. Another advantage which suggests itself in this treatment of the brush is that a little formaldehyde, a tissue hardener, may be retained in the brush and applied with benefit to the soft, sensitive gums of those who suffer from pyorrhea alveolaris.—*The Dental Record*.

RESTORING FAULTY MARGINS ON INLAYS.—(1) Cut box cavity in inlay involving faulty margin; (2) Take a rope of gold foil just large enough to fill cavity; (3) Place inlay in position in the mouth and burnish gold foil over the margin of the tooth; (4) Remove inlay from the mouth and solder with 22k. solder. The foil absorbs the solder and becomes united to the inlay.—*J. A. Kaplan, D.D.S., Chicago (Dental Review)*.

Obituary

WE regret to have to chronicle the death of Charles Llewellyn Hawley, L.D.S., of the Town of Trenton, which occurred on February 2nd, 1915, after a brief illness.

The deceased graduated from the Royal College of Dental Surgeons of Ontario in the year 1881. Immediately after receiving his diploma, he returned to his native town, where he engaged in practice. By close attention to his work he built up a large and widespread practice, and was soon recognized as a skilful operator, well versed in dentistry, observant, quick and resourceful.

The late C. L. Hawley was of a most affable and genial disposition, and was highly esteemed by his confrères and a large circle of admiring friends. J. F. Simpson, L.D.S., D.D.S., of Trenton, was one of his students. The deceased was a son of the late Albert D. C. Hawley, one of the pioneer settlers of Trenton, who was for years a most successful druggist. The deceased is survived by his mother, wife, three sons, three brothers and two sisters, who mourn his loss.

The late C. L. Hawley took an active part in the affairs of the town, and was for some time a member of the Town Council. In his younger days he was quite an athlete, and took great interest in all kinds of athletics, especially lacrosse. In fraternal circles he was an ardent Oddfellow, and quite recently received a veteran's jewel, a badge of honor for twenty-five consecutive years' membership. In religion he was an Anglican. Politically, he was a lifelong and enthusiastic Conservative.

The late C. L. Hawley was a descendant of Joseph Hawley, who was the founder of the Hawley family in the Colony of Massachusetts, U.S., about the year 1640. The name Hawley is of great antiquity, and occurs in the eleventh century, in the person of Hansard Hastings Hadley, one of the Normans, who came over with William the Conqueror. The original house of Hawley was founded at Dartmouth, Devonshire, England, of which Sir Henry Hawley was the first Baronet.

MULTUM IN PARVO

This Department is Edited by C. A. KENNEDY, D. D. S., 2 College St., Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION. SENT IN BY MEMBERS
OF THE PROFESSION, WILL BE GREATLY APPRECIATED BY THIS DEPARTMENT

THE STERILIZATION OF INSTRUMENTS.—One is safe in sterilizing instruments by boiling them, but there are some drawbacks to this method which hinder its application. One is rusting and thereby marring the appearance of the instruments. A very efficacious method I use in my office for my forceps, and it can be used for all other instruments, is one pint of tincture of green soap with four grains of bichlorid of mercury. Procure a large glass jar, Mason or glass-covered one, with sufficient depth that the instruments can stand on end without interfering with cover. Put quantity of water in to cover two inches or more of the instruments, and add to this one ounce of the solution. This will not tarnish the instruments, however long they remain in it.—*Dudley Dean Bayless, Dental Review.*

RESTORING CUSPID EMINENCE.—To restore the lost features by the extraction of the cuspid teeth, the plate can and should be worn higher over the cuspid eminence, but dropping suddenly back of it to give free play for the muscle. The gum should be two to three times thicker than over the incisors.—*L. P. Haskell, Chicago (Dental Review).*

KEEPING AN AMALGAM MORTAR CLEAN.—After having thoroughly mixed the alloy and mercury, a few drops of alcohol are poured into the mortar and the amalgam is reground. The alcohol will clean the amalgam considerably, allowing a higher polish subsequently; moreover, when inverted the amalgam will readily fall out of the mortar, leaving the latter clean. The alcohol can easily be drained out of the mortar before the amalgam is tipped out.—*Brit. Jour. of Dental Science, (Dental Cosmos).*

REMOVING CHLORO-PERCHA STAINS FROM A CAVITY.—After a root-filling has been inserted by means of chloro-percha, it is usually found that the surplus adheres to the walls of

the cavity and is very difficult to remove entirely. This can be readily done by dipping a pledget of cotton in absolute alcohol and swabbing out the cavity. Chloroform simply tends to spread the material more evenly over the walls, whereas the alcohol completely removes it.—*W. J. T., Austral. Jour. of Dentistry (Dental Cosmos).*

EMETINE FOR ARRESTING HEMORRHAGES FOLLOWING TONSILLECTOMY.—Emetine hydrochlorid is being used successfully to arrest or prevent hemorrhage following tonsillectomy.—*Medical Summary (Dental Cosmos).*

TO REMOVE INK STAINS.—When the finger is stained with ink and you have no sand soap in the office, just take a match, moisten slightly, and rub over the discolored parts.—*F. S. Dilger, D.D.S., Chicago, Ill. (Dental Review).*

A VULCANIZED BASE-PLATE.—In the case of the flat lower jaw, it is a good plan to vulcanize the plate first; then there is something substantial on which to take the bite and set up the teeth.—*L. P. Haskell, Chicago, Ill. (Dental Review).*

A PORCELAIN BAKED CROWN.—A crown which, I believe, still has a place in this work is the porcelain baked crown. Since the advent of the different makes of the all porcelain crown and the casting method the porcelain baked crown has in the majority of offices been relegated to the past; but in some of the long-bite cases, where the gum line at the labial or buccal is high and at the lingual low, the porcelain baked crown meets the condition possibly better than any other.—*R. E. MacBoyle, D.D.S., Chicago, Ill. (Dental Review).*

SYMPTOMS OF TREATING FROM ANALGESIA TO ANESTHESIA.—Since analgesia merges into anesthesia, the symptoms which indicate the development of anesthesia should be closely watched. These may be enumerated in their usual order of onset as follows: Closing of the mouth, closing of the eyes, and staring as if blind; no response to questions; automatic, mechanical respiratory rhythm; snoring—which is rare, however; relaxed eyelids; slow rotating movement or else stationary position of the eyes; sluggishness of the pupils; purplish-pink color of the nails and lips; general relaxation.—*E. J. McKesson, Dental Summary (Dental Cosmos).*

CORRESPONDENCE

159 Wellington St., Kingston, Ont., May 4, 1915.

To the Editor, Oral Health:

Having been appointed Dental Surgeon with No. 5 Stationary Hospital, Queen's University, for overseas service, I would like to acknowledge a splendid gift from The Temple-Pattison Co., of Toronto, of a traveling case and set of operating instruments.

When we arrive in England we receive our equipment, but I expect it will be just the necessities, and this case I know will be useful on board ship and in France.

Yours truly,

ERNEST B. SPARKS, D.D.S., I.D.S.

Letter From Captain Corrigan

Belgium, April 30, 1915.

BEFORE this letter reaches you, you will have read accounts of the splendid work done by the Canadian Division during the past week. They are credited with saving the situation at a most critical time, and I believe that is quite correct. Unfortunately the casualties were very heavy, and I feel very much the loss of a number of personal friends. True to its name, this district was indeed to many the "Valley of Death." It was a terrible week. It seems a hopeless task to even try to describe it. I might take some single incident or scene and write a letter, but to look back on it now, it is just a mass of impressions. On Thursday afternoon about 5 o'clock I had just left a small chateau about a mile from our billet, where Col. Simson had his headquarters, when I heard the boom of a big gun and a shell dropped in a field nearby. One of our guns concealed in a hedge quite near replied. Others on both sides rapidly became engaged and I stood for half an hour watching it, little realizing that it was the beginning of such a battle and to last for more than a week. An hour or two later we were surprised to see crowds of refugees fleeing from the road and trying to remove their more valuable possessions in all kinds of vehicles, from a wheel-

barrow or push-cart to a big lumbering brewer's van. Some were driving their cattle before them and all were loaded down with bags, boxes and parcels of every description. Then followed French Territorial troops retreating helter-skelter, some with rifles, some without. Word came along that our infantry were being driven back, and for quite a time it looked as if a general retreat were imminent. I shall never forget that night and the days and nights which followed, the work, the confusion, the excitement, the danger and above all the noise. The congestion on the roads made the work of getting our convoys through difficult. Fleeing refugees, infantry, reinforcements, guns, long lines of motor lorries and ambulances, ammunition wagons and battery limbers, with six-horse teams, rushing ammunition up at the gallop; wounded men coming back, those who could, walking, others being carried on stretchers, in wagons or motors; despatch riders tearing around on motorcycle, bicycle or horse. And enveloping it all the continuous thunder of the guns, the bursting of shrapnel and the odor of the poisonous gases. Ten wagons were detailed each night from the "train" to carry supplies to the trenches. It was devilish nerve-racking work, as it was all in the open immediately behind the trenches. The first night the guide lost his way and in the congestion on the roads our convoy became broken. One of my N.C.O.'s—a corporal from Grimsby—found himself lost and in command of four wagons. He rode back to the crossroads in St. Jean, and while speaking to an officer a shell burst, blowing the officer to pieces, killing and wounding about two dozen men of the Fourth Brigade, who were passing, and setting fire to an ambulance wagon filled with wounded. His horse was wounded and his clothes spattered with blood. This was but one of the many narrow escapes. Next day a report came down that our brigade headquarters were cut off and without food, so that three of us took a motor, piled on four cases of grub, and tried to reach them. We went through the north end of Ypres, where a day or two before our division had been billeted, and many inhabitants yet remained. There was now nothing but wreck and ruin; houses demolished and the streets strewn with dead men, horses, cows, etc., smashed wagons, water carts, ambulances and motorcycles. It was a terrible sight, and one not soon to be erased from the memory. From there we raced up the road through St. Jean to a barricade of sand bags this side of Weiltje. We were then only about 300 yards from our destination, but were unable to go farther by motor. The fire was too severe. We

shouldered the cases and tried to get through on foot, but had to drop them every few minutes to take shelter behind sand bags, brick walls or in ditches. In a lull in the firing we finally completed our mission. This is but one incident of that terrible week. I shall have to tell you of others some other time.

We are to move to-night to a point some distance away where what remains of the Canadian Division can be rested, reorganized and re-equipped. I have yet to hear of one instance where a Canadian flunked, and I know of one case where when the roll was called afterwards only two hundred and some odd answered to their names out of a whole battalion of over 1,000. They found five or six who were hiding flesh wounds they had received for fear they would be prevented from returning to the trenches. I might continue indefinitely telling of incidents of that week, but time will not permit. It will be a sorrowful day for Canada when the casualty lists are published, but I am sure you will all agree that the boys of the First Contingent have so far done their best, and that those who have given their lives have not died in vain.

C. A. CORRIGAN.

The Buccal Protozoa

TWO important communications upon the protozoa of the buccal cavity have recently been made, the one by Professor Allen J. Smith and Dr. M. T. Barrett, read before the recent meeting of the Pennsylvania State Dental Society in Philadelphia, and the other by Professor Angelo Chiavaro (Rome), read in Paris before the American Dental Society of Europe.

The latter paper is essentially a biological study of the two principal varieties of protozoa thus far identified as found in the mouth, viz., *Entameba buccalis* and *Flagellata hominis*. Of the sixty-eight specimens examined from sixty-eight individual cases, twenty-two were pyorrhetic, and in all the rest entamebe were found abundantly; the protozoon also existed in fourteen other cases, but in small number, leaving a total of thirty-two in which the organism was absent.

The entameba was not found in various cavities where the carious process was in active progress, due doubtless to the observed fact that the entameba dies in an acid medium. The practically constant presence of these protozoal organisms in the pus exudation in pyorrhoeal cases observed also

by Professor Allen J. Smith and Dr. M. T. Barrett led the former to test emetin hydrochloride as a topical application in pyorrhea, upon the assumption that ipecacuanha having been shown to be toxic to the ameba coli by its use in the treatment of amebic dysentery, it might be of value in destroying microbes present in pyorrhea. He further assumes that the protozoa in question are the originators of the inflammatory process in pyorrhea alveolaris.

The practical test of the treatment by emetin hydrochloride has given results that are encouraging, and have been corroborated by independent workers.

The method adopted in the clinical tests is to cleanse all pus pockets by pressure and irrigation with physiological salt solution or distilled water, so as to eliminate all pus exudation, and then to instil, by means of a blunt-pointed hypodermic syringe, or other suitable applicator, a few drops of a 1 per cent. solution of emetin hydrochloride into the pockets, anointing their margins with petrolatum or vaseline, to retain the solution in contact with the pocket walls. This is repeated every other day until all pus and inflammation subside, then thorough instrumental removal of deposits on root surfaces is instituted.

If the 1 per cent. solution of emetin is found to be locally irritating it may be diluted. The drug is fatally toxic to amebe in a dilution of 1 : 10,000. After some minutes' exposure they die in a sol. as dilute as 1 : 100,000. The drug is not toxic to man and does not produce nausea when injected hypodermically in doses of one-third grain (0.02 gm.), and as much as one-half grain has been injected without producing unpleasant effects. When taken into the stomach it provokes active emesis.

The study of the subject thus far has brought out the important practical fact that emetin appears to have in pyorrhea treatment a therapeutic action of far greater efficiency than any other medicament known to dental materia medica, and the further scientific study of its action must undoubtedly reveal in time some of the fundamental causes of this puzzling group of disorders so destructive to the integrity of the masticating mechanism and to the general bodily health.—*Dr. E. C. Kirk, in Dental Cosmos.*

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Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, 229 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to the Publishers, Oral Health, 229 College St., Toronto, Canada.

Vol. 5

TORONTO, JUNE, 1915

No. 6

EDITORIAL

Dental College Endowments

ELSEWHERE in this issue will be found a report of the transactions of the Board of the Royal College of Dental Surgeons of Ontario. The Treasurer's Report shows a balance on hand of \$11,796.92. During the year the capital expenditures of the College amounted to approximately \$6,883.33. The financial needs of a rapidly-growing College and an advancing profession are such as to constantly demand very heavy expenditures on capital account. The Royal College is in the unique position of being able to meet its current liabilities and make all necessary capital expenditures without receiving either public or private grants. It has, from time to time, out of its own resources, made building extensions, and has continually maintained its equipment and teaching methods at the highest point of efficiency. The record of the Toronto College is unusual. Most colleges find it difficult to meet their financial needs, even with what outside help may be available.

The "problem of prevention" is pressing more and more heavily upon the dental profession. This problem can best be solved through the dental colleges. Financial help is required, and the general public may properly be called upon to bear a share of the burden. Practitioners of dentistry may well direct the attention of wealthy patients to the tremendous public advantage to be gained by a solution of the problem of susceptibility and immunity to dental caries. A great public service will be rendered by the establishment in dental colleges of departments devoted to research and the prevention of dental disease. Back of every great philanthropy there has been the seed sown. What wonderful fruit was the Forsythe Dental Institute! Who planted the seed—what dentist is the "father" of this Institute? Though his name is generally unknown to the dental profession, he is a real benefactor, and rendered a great service to mankind and the profession of dentistry.

As opportunity presents, practising dentists should not fail to direct the attention of wealthy patients to the service to be rendered humanity in the endowment of departments of research in connection with colleges of dentistry.

Dr. Edgar D. Coolidge

OUR frontispiece this issue is a photograph of Dr. Edgar D. Coolidge, of Chicago, who recently associated himself with ORAL HEALTH as Contributing Editor. Dr. Coolidge graduated from the Galesburg, Ill., High School in 1898, entered Knox College in 1901, and Chicago College of Dental Surgery in 1903. He graduated from the Chicago College in 1906, entering into dental practice in Chicago during the same year.

Dr. Coolidge has been continuously engaged in college work since graduation. He was Demonstrator in the Clinic at C. C. D. S. in 1907, and subsequently accepted the position of Instructor of Operative Technics in that school. In 1913 he was appointed Professor and head of the department of Materia Medica and Therapeutics at the University of Illinois College of Dentistry. Dr. Coolidge is a member of Xi Psi Phi Fraternity and of the Chicago Dental, Illinois State Dental and National Dental Societies.

R. C. D. S. Tablet for War Heroes

THE Board of Directors of the Royal College of Dental Surgeons is very anxious to have a complete list of all the graduates and students who have enlisted or been appointed for overseas service.

In order to assist in the compilation of this list, anyone who knows of any such graduate or student of the R. C. D. S. is requested to forward to Dr. W. E. Willmott, 96 College Street, the name and rank and, where possible, the corps or unit to which attached.

It is the intention of the Board to have prepared a suitable tablet, to be hung in the Rotunda of the College Building, containing the names of those who take part in the war

Oral Hygiene Reports

Maryland.—The Oral Hygiene Council, of the Maryland State Dental Association, through its chairman, Dr. B. Holly Smith, made a report of dental services rendered at No. 9 Public School, Greene and Fayette Streets, from November 10, 1913, to May 29, 1914, at the annual meeting of the association.

So much interest is manifested in these services that children who formerly remained at home with the toothache now gladly bring their toothache to school.

The dental clinic at the Parental School, near Catonsville, which has been maintained for several years, has been productive of great improvement in spirit, health and study of the truant lads detained there. Dr. J. H. Hoffman voluntarily gives three afternoons a week to the school.

A clinic has also been inaugurated at Annapolis Junction for the Junior Republic, where 53 children are found, and School No. 76, at Locust Point, has asked the association to establish one there.

New Regulations

Canadian Army Dental Corps.

ORDERS have been issued that recruits wearing partial dentures may be enlisted for overseas service.

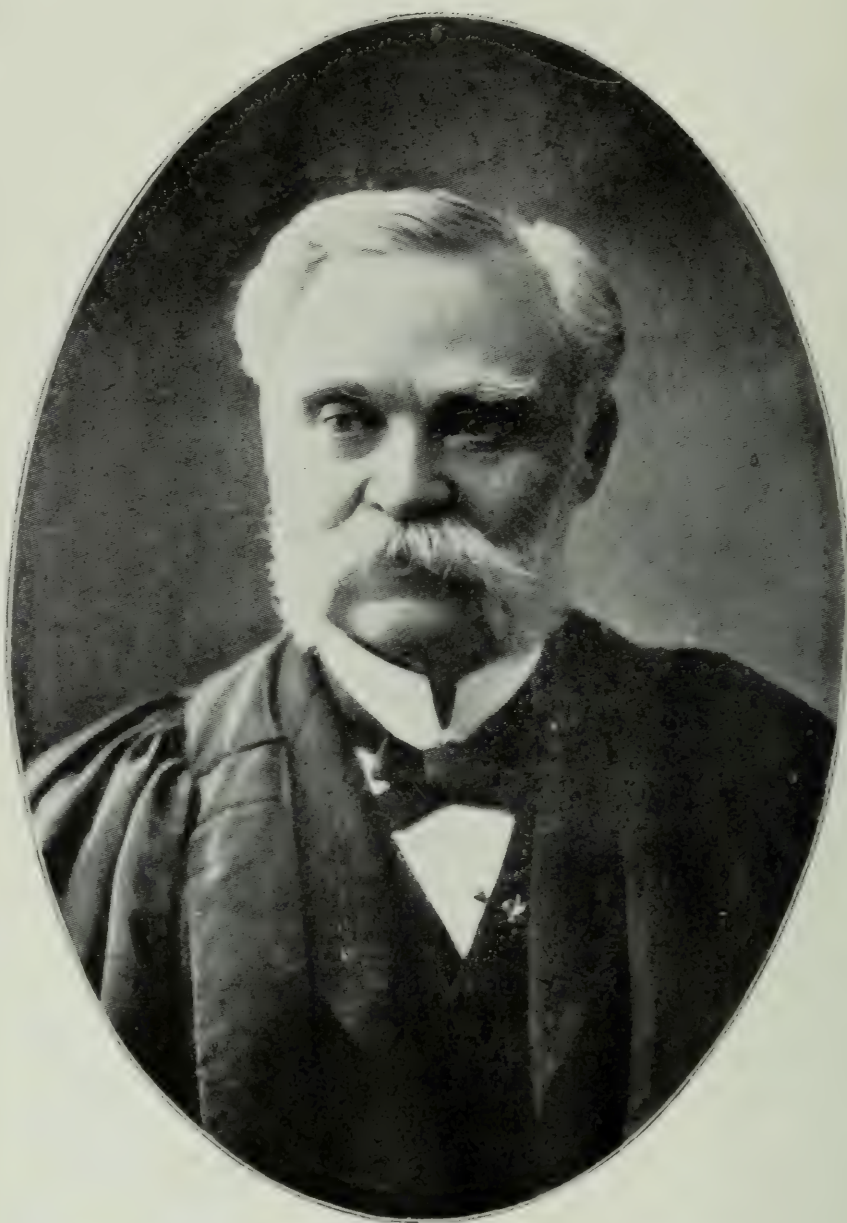
Authority has been given the Chief Dental Surgeon, Lt.-Col. J. Alex. Armstrong, to appoint dental surgeons to the mobilization camps who will proceed overseas with the unit to which they are attached.

Pursuant to this regulation Dr. Guy Hume, of Toronto, has been appointed to Niagara Camp.

In Loving Memory of

James Branston Willmott, D.D.S., M.D.S., LL.D.

Dean of the Royal College of Dental Surgeons
of Toronto



The Late James Branston Willmott

*Born Milton, Ontario
15th June, 1837*

*Died Toronto, Ontario
14th June, 1915*

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 5.

TORONTO, JULY, 1915

No. 7

In Appreciation of the Late James Branston Willmott

President Falconer, University of Toronto

THE death of Dean Willmott has removed a very familiar figure, and one greatly respected, from our midst. Up till the very end he gave faithful service in the performance of his duties in connection with the University. He was always to be counted on at committees, where his judgment was sound and carried great influence. In the Senate he sat as a modest member, rarely speaking; but when he did speak he was listened to with great regard. Kindly, wise and gentle, he made no enemies, but he held his opinions strongly and had deep convictions.

Dr. Willmott will long be remembered for his work in bringing the profession of dentistry into close relations with the University. What he did for the profession of dentistry itself others, better qualified than I, will speak of. But as I think of him, he stands before me as one who quietly but persistently endeavored, on the one hand, to raise the standard of dentistry, so as to prove that it was worthy of University recognition, and who, on the other hand, was very desirous that the University should go further and take over the College of Dental Surgeons as a regular faculty of the University. Some six or seven years ago he had the matter brought before the Board of Governors of the University, and was at that time hopeful that his aim would be accomplished. But it was shortly after the reor-

ganization of the University, and the Board had already taken on three new faculties, together with many other financial responsibilities. In these circumstances, they felt that the additional obligation of being fully responsible for a faculty of Dentistry was more than they should at the time assume. Dr. Willmott was, I believe, disappointed, but he felt that a better time would come in the future.

In the matter of standards he was always ambitious for better things, and had a high matriculation requirement made for entrance, and then had the standards, both as to teaching and the length of the course, constantly improved.

In recognition of his pre-eminent position in his own profession, and of his work for dentistry, both in the Royal College of Dental Surgeons and in the University, the Senate conferred upon him the honorary degree of Doctor of Laws two years ago. It was, I believe, admitted that the honor was worthily bestowed, as it was gracefully worn. Fortunately for him and for his friends, he was able to do his work to the end without much abatement of his energy and with a clear mind. Few men can be happier than one who, like him, was so honorable and useful through such a long career, and who, without lengthened suffering, passed away before most of us knew that the time had come for him to lay down his work.

R. A. FALCONER.

June 22nd, 1915.

President R. P. Bowles, Victoria College, Toronto

THE high estate of the dental profession in Ontario to-day pays eloquent tribute to the work of Dr. J. B. Willmott. No profession in Canada was ever better served than was the profession of dentistry by Dean Willmott. When dentistry could scarcely be called a profession he saw the needs and possibilities, and undertook the great work of founding a school which would teach the principles and practice of what he regarded as a high calling of great value to the community. Through good report and evil he pursued the ends he had before him, and accomplished a work of supreme value. Apart from this great work, Dr. Willmott was well known in the community as a helper of all good causes. He was devoted to his church, and was for many years the teacher of a large Bible Class. Several times he was elected a member of the highest courts of the church, and in all capacities proved himself a man of sound

judgment, broad vision and unselfish aims. Perhaps the constancy of Dr. Willmott's devotion to unselfish purposes was the chief distinction of his character. His Christian ideals of service entered into all his work, and, in my humble judgment, the profession of dentistry to-day in Ontario and other portions of Canada shows in many ways the influence of Dr. Willmott's fine ethical principles, of his conscientious regard for the welfare of the community, and of his belief in, and devotion to, the science of his profession.

R. P. BOWLES.

R. A. Reeve, M.D., LL.D., Toronto

IN thinking of Dean Willmott, whose passing away is so widely lamented, one's thoughts revert to the impressions of an early acquaintance, formed thirty odd years ago. To know him was to respect him, and this feeling grew with the years, and as his varied capacities were revealed.

With constant devotion to high ideals, he was always a leader in the effort to elevate the profession of his choice, in which he evidently took an intense interest, and not without success. Service, not emolument, seemed ever his watchword; and towards the close of a highly honorable career his retrospect of many years, covering the most important epoch in the history of the dental profession of this country, naturally gave him much satisfaction—the more so, doubtless, as he could not but realize that his own time and efforts freely given had not been in vain.

After the Dean became a member of the Senate of the University the writer was able to judge the better of his qualities, and can testify that he was a model member of that body and of its committees. He always showed he had a thorough grasp of any subject he had to discuss; and his sound judgment, well-balanced mind, and single aim gave his opinion great weight. His high personal character and ample experience, his broad mental equipment and his recognized standing enabled him to fill the onerous and responsible position of Dean throughout with great success, and to leave a permanent impression for good upon a whole generation of graduates.

In conferring upon him the degree of LL.D., the University of Toronto marked its appreciation of his great services in the cause of professional education.

The complimentary banquet to the veteran Dean at the opening of the splendid new building of the Royal College

of Dental Surgeons was a fitting and opportune recognition of his worth and work, as was shown by the spontaneous and glowing tributes of a number of representative men gathered from near and far.

The dental profession has suffered a great loss in the death of its doyen, but it will not be irreparable if his legacy of lofty ideals and unselfish devotion is ever treasured.

R. A. REEVE.

C. N. Johnson, M.A., D.D.S., Chicago

TO be requested to pay tribute to the memory of a man who was my teacher in college more than thirty years ago, and who has remained my freind ever since, is a task at the same time pleasant and painful. It is pleasant to indulge the pride that he was my friend for so many years; it is painful to realize that after all these years I must now say farewell to him forever. Dean Willmott meant more to me, he meant more to the profession, than most men. He meant more to Canadian dentistry during the days of its organization than will ever be computed. I do not know where in any land the profession of that land owed more to a single individual than the profession of Canada owed to Dr. Willmott.

And it was not only his ability as an organizer which told for the betterment of the profession. Probably his greatest service came from his function as a teacher and exemplar, and the model he held up before young men in his own sterling character. No young man was ever graduated from the R.C.D.S. without a higher conception of professional obligation and a keener sense of the essence of ethics and right living, because of the unswerving adherence to these principles on the part of the man who remained at the head of the institution from the earliest days of its organization. The name of Dr. Willmott will always be indissolubly linked with the science of morals and the theory of integrity.

At times when the tendency seemed to drift toward the disintegration of ethical standards on the part of the profession, he stood like a bulwark against the stream, and his influence was no small factor in turning the tide and directing it into proper professional channels. No one ever doubted where Dr. Willmott stood on any question affecting the welfare of dentistry, and his far-seeing vision and basic honesty usually placed him on the right side.

I could write at much greater length regarding the life and works of our dear departed Dean, but I could say no more in the end than to affirm that, of all the men who have stood foremost in the ranks of professional progress for nearly half a century, no one has labored more persistently or with purer purpose for the betterment of his fellow-men than Dr. James Branston Willmott.

To me, personally, his death comes with a sense of shock and sadness. I would that it had been mine to look into his face once more, and say the last farewell. I would that I might have been permitted to smoothe his pillow or place the cooling draught to his fevered lips. But now that he is gone I must content myself with bringing to his feet my humble wreath—a wreath of immortelles.

Chicago, June 19, 1915.

C. N. JOHNSON.

Ellison Hillyer, D.D.S., Brooklyn, N. Y.

WORDS fail me when I think of the passing away of Dr. J. B. Willmott. If ever there was a God's nobleman on earth, he was one. Canada is richer to-day by the inheritance of his memory than she was even in the possession of his presence as a man. That is saying much for his influence upon all around him was marked. How we will miss his quiet, genial, calm presence amongst us! Who will fill his place as counsellor—his judgment and experience were so vast? Yet his memory now makes all that he has done and said as so much gold and precious stones, stored up as a treasure.

Teaching associations have afforded me a wonderful opportunity of coming very close to Dr. Willmott for many years, and the occasions of our meetings from time to time have been enhanced in value as they have been attended by his presence. How fortunate it was (or was it the special will of a Divine Providence?) that he was spared to enjoy the culmination of his career in honors conferred upon him only last year! Would that the world at large would awake to the opportunities offered in honoring the living as they have done Dr. Willmott. The last time it was my good fortune to be with him was at Ann Arbor in January last. During the convention we were escorted through the various departments of the University of Michigan, concluding with an organ and violin recital in that magnificent music hall on the campus. I sat next to Dr. Willmott, and as the great organ passed through the cadences of Borowski's beautiful

“Adoration,” I could not but feel how wonderful the music seemed to fit to the career of the grand old man beside me. There are quiet passages in it. Yet there is a fixed theme entirely pervading it, growing to a climax which carries one’s soul along with it. It seemed to so well exemplify his life—quiet, forceful, dignified, happy, yet filled with a definite purpose felt by all with whom he came in contact. And as “Adoration” quietly closes its last bars, so Dean Willmott’s life has closed to our sight, but his memory will be with us as long as we shall live. ELLISON HILLYER.

Henry Morgan, M.D., D.D.S., Nashville, Tenn.

WITH eyes dimmed with tears and an aching heart, I read your telegram yesterday, bringing me the news that my dear friend had answered the Master’s summons. His sudden death is a great shock, and my tenderest sympathies go out to his family and college associates.

That period of dental history covered by the life of Dr. James Branston Willmott has been its most productive in changes and scientific growth, and when an account of it is given it will be found that his name will be coupled with its most important events.

From the day he assumed the duties of Dean of the Royal College, his conscientious attitude as executive and teacher has exalted both, and he has demanded and received the best that there was in those with whom he was so closely associated. He exalted his profession to a degree that enabled others to recognize its opportunities, its dignity and the chances to benefit humanity are greater for his having lived.

Sound in judgment of man, kindly in criticism, ever ready to help and assist when an occasion offered, and free from any sordid motives, he became a force for good, and his influence and counsel were always sought by those who knew him. His ethical bias was strong, his conviction as to right and wrong discriminating and sound, and once he made up his mind he stood his ground uncompromisingly. His opinions were never obtruded on others or paraded; but when he was asked, he never hesitated a moment to express and defend them.

He was, therefore, a man of strong personal character and force, and it was these attributes that drew men of conviction to him.

His religious character was of the quiet, unostentatious

kind, but it was a part of his life, deep, sound and always understood by those who associated with him. Probably for most persons the influence of Dr. Willmott will long survive through his wonderful personality. Full of years and of faith and of good work, he goes to his reward.

“Now the laborers’ task is o’er;
Now the battle day is past;
Now upon the farther shore
Lands the voyager at last.
Father, in Thy gracious keeping
Leave we now Thy servant sleeping.”

We feel the pang of separation; the grief of bereavement is ours; and we mourn sincerely with all those who are near and dear to him.

HENRY W. MORGAN.

Frank Woodbury, Dean, Faculty of Dentistry, Dalhousie University

IT is only a few days since, in reading the report of the Annual Meeting of the Royal College of Dental Surgeons, that I noticed Dr. Willmott was again elected Secretary. And now a telegram announces his “departure” from among us.

My first acquaintance with him dates back to 1892, which began with the first correspondence respecting reciprocity in registration between the Provincial Dental Boards. Among all correspondence then held, Dr. Willmott was the only one who was optimistic, or even favorable. From that time till now our friendship has been ripening. In the whole long period of the development of the Dominion Dental Council the ripe experience of Dr. Willmott as an educationalist has been a tower of strength to that movement.

When establishing our own Dalhousie Dental Faculty, he was a friend on whom we could rely for wise counsel, thereby avoiding many rocks upon which we might have struck.

I suppose it will be a common phrase from the pen of many, “He was the ‘Nestor’ of Dentistry in Canada.” He certainly was the “Dean” of the dental profession in our Dominion, and no man was better known or more respected throughout the continent.

He will be sorely missed, and our national gatherings will hereafter seem not quite the same. To us who are older and have met and known a long chain of men who

have laid deeply the foundations of our profession, we find among the last links Dr. J. Branston Willmott.

I must add that I have rarely known a man who displayed a more consistent Christian character. We were rarely alone together without his conversation drifting to heart experiences and eternal things, of which he had much to say.

I am sure that the host of young men who have come under the direct influences of his training feel that a true friend and interested Christian teacher has gone.

I want to express the deep sympathy of the dental profession in Nova Scotia and the Dental Faculty of Dalhousie University to the bereaved friends of him who will be known as the "father of modern dentistry in Canada."

It is appropriate in this connection to quote Longfellow:

"There is no death; what seems so is transition.

This life of mortal breath

Is but the gateway of the life Elysian,

Whose portal we call death."

FRANK WOODBURY.

W.D. Cowan, D.D.S., Secretary, Dominion Dental Council

A WIRE apprising me of the death of Dr. J. B. Willmott came as a great surprise and shock.

My first thought, upon learning the truth, was that my life might somewhat approximate in success the life which has just closed.

I know nothing of his worldly possessions. In that way I cannot measure his success; but as a man and a leader amongst men he was a success.

His was a leading rather than a directing life. His suggestions, not his orders, ruled. Some rule by force; others by reason. Some command; others command respect. In the latter case, sound judgment, combined with courtesy and a clear moral perception, founds the basis. I think all those who knew him and knew him well will say this latter is a good portrait of the late Dr. Willmott.

Sorry to say, I am not a graduate of the College of which he is the father. I cannot, therefore, speak as the thousands who have been his students. My connection with him has been a business one, done mostly at a distance of two thousand miles. Promptness, completeness—these seemingly were the essentials upon which he did business with me. Of the hundreds of letters I have written him,

every one was attended to the same day, and in not a single case was anything left to be attended to at a more convenient date. Finish your work as you go; be complete in all of your undertakings. This is the example he set to me; I fancy also to all of his students. This is probably why so many of his graduates are successful dentists, for in our profession only finished work is dentistry.

I said I found him a leader rather than a director of men. One example: In 1904, representatives from all over Canada met in Toronto to consider a Dominion Council. For two days we discussed and agreed that it should be but could not solve the problem of how it should be. Numerous resolutions were offered and thrown aside or withdrawn. Late in the afternoon Dr. Willmott handed me (as provisional secretary) a postcard on which he had written a resolution. "How will that do?" he said. It was read and adopted. We travelled back to our homes on that postcard. One year later we travelled to Montreal on his postcard, and there founded the D.D.C. He suggested; others ordered on his suggestion, and we all acted on the orders. As I have seen him, that sums up his life. I will miss his suggestions and advice. I believe we all will.

W. D. COWAN.

G. S. Caesar, D.D.S., Goderich, Ont.

I WAS grieved to see by the Toronto daily papers the death of Dr. James Branston Willmott.

It has been my privilege to have known the late Dr. Willmott intimately for over forty years, during which time our relations have been most friendly. He appeared to have, above all, one object in life—the betterment of our profession, and his death will be a loss to us all.

As Dean and Secretary of the Royal College of Dental Surgeons, his death will leave a difficult office to fill. He was so conversant with the laws pertaining to the profession the world over.

Mrs. Willmott and Dr. Walter Willmott have my sympathy in this, their sad bereavement.

G. S. CAESAR.

Horace E. Eaton, D.D.S., Toronto

WITH the passing of Dr. J. Branston Willmott, the dental profession has lost a great man and a wise leader. There are many men who may follow, but to only a few is it given to lead. With him at the helm, the ship of our profession has been safely guided for many years past hidden rocks and treacherous shoals, until at last she has come into the wide ocean, where, under full sail and course laid out, she is steadily making her way towards the ultimate goal.

Were I asked the secret of his greatness I would reply in a word: early in his professional career he was possessed of a strong conviction and he had the courage to work it out.

His interests in life were largely clustered about two lines of activity—his profession and his church. After all, does this not fulfil the requirements for the best development of man—his daily task and his spiritual growth?

There are those who labor solely for personal gain; others for the praise of men; but Dr. Willmott's zeal for his profession was so unselfish that these things seemed quite overshadowed.

I was greatly impressed a few years ago when the members of the profession, wishing to show their appreciation of his valued services, proposed that a memorial window be placed in the Dental College. I was delegated to secure Dr. Willmott's consent. When conveyed to him their wish he sat for a moment in silence. I noticed a tear trickle down his cheek. Finally, he said, "I cannot understand why they wish to do this for me." The thought was a new one to him. In his zeal and concern for the welfare of his beloved profession, the idea of any personal recognition had not occurred to him.

Dr. Willmott has gone to his reward. The words of the Apostle Paul are surely applicable to him: "I have fought a good fight, I have finished my course, I have kept the faith. Henceforth there is laid up for me a crown of righteousness, which the Lord, the righteous Judge, shall give me at that day."

H. E. EATON.

R. G. McLaughlin, D.D.S., Toronto

WHOM *being dead still liveth.* This is the thought that must predominate when we consider the translation of our late Dean. In respectful, loving memory he still lives in the minds and hearts of the long line of students who, in succeeding years, have passed under his care. He has left an impression on the dental profession of Ontario that even the passing years cannot efface.

From the date of its birth he nourished and watched over the struggling profession as a mother her babe, till eventually it had attained to the full stature, and now stands before the public as a monument of his persevering care and wisdom. That was the life work of Dr. J. B. Willmott. That task well done, he laid down his tools and the Almighty arms gathered him to his well-earned rest.

From early manhood he had one ambition--that he might live to see the dental profession of Ontario rank amongst the nobler callings of the age. That ambition was realized. What the dental profession of Canada is to-day is largely due to the untiring energy and wise guidance of Dr. Willmott.

But Dean Willmott was more than a dentist. He was a worthy citizen and a Christian gentleman. As Dean of a great educational institution, he felt it his duty and his privilege to ever lead his students on towards the higher ideals.

Away back in the early College days, when Dean Willmott stood before us for the first time, two chief characteristics were impressed upon me: His earnest desire that we should so measure up professionally as to be a credit to the Royal College of Dental Surgeons. And just as anxious was he that our higher natures should not be neglected. Well do I remember that his first invitation to the class as a body was to attend the Men's Bible Class in the Metropolitan Church of this city. Undoubtedly the place he filled in life was a large one, and it truly can be said that Canada, as a nation, and dentistry, as a profession, are richer to-day because of the life and work of our beloved Dean.

R. G. McLAUGHLIN.

*Rosin Solution**

J. R. CALLAHAN, D.D.S., CINCINNATI, OHIO.

R Rosin gr xii
Chloroform 3iij
M. Fiat. Sol.

COLOPHONY resin, commonly known as rosin, is obtained from turpentine by distillation. In the process the oil of turpentine comes over and the rosin remains behind. Rosin varies in color from dark red-brown to black or white, according to its purity and the degree of heat used in its preparation. Chemically it is the anhydrid of abietic acid. It has the physical and chemical properties common to all resins. It softens at 176 degrees F. and fuses completely at 275 degrees F. Is insoluble in water: with difficulty is soluble in alcohol: freely soluble in chloroform, acetone, benzene and fatty oils.

The rosin that is best adapted to dental uses that I have been able to find, is that prepared by Bernardel for the use of the violinist. A French preparation very near the color of dentine. The formula as given above makes a very thin solution. It required a long time for me to realize the advantage in the use of a thin solution. A thick mixture will not penetrate the tubules, nor does it give up enough chloroform to dissolve the gutta-percha.

As we are to deal with dentine that has been subjected to infection, a brief rehearsal of the histological anatomy of dentin will aid us in getting our mental eyes in the same focus.

Arthur Hopewell Smith in his late book, "An Introduction to Dental Anatomy and Physiology," says: "The functions of dentin are to give substance to the tooth itself, to provide a centre of sensation, to protect the pulp. Enamel is without the pale of nutrition. The pulp is highly vitalized and the dentin is on the borderline of the living and the dead. Semi-vitalized, if one may so speak.

"Nature would not for a moment tolerate the presence in the midst of living tissues, of a dead body like enamel. The result is therefore the presence between the living pulp and the inert enamel of a large area, relatively speaking, of a tissue which is marvelous and unique. In no other part of the body do we find an entirely tubular structure like dentine. Its peripheral parts where it joins the inorganic enamel and cementum are less vitalized than its central parts. This explains the reason why the dentinal tubules are not of the same caliber throughout their lengths. They

*Read before the Brooklyn Dental Society, March, 1915.

vary from 1.7 u. to 5 u. The diameter of the tube diminishes as it proceeds outward, until at the peripheral region of the tooth it becomes immeasurable. The dentin of the crown of teeth is more plentifully supplied with living material (protoplasm) than the roots: hence the tubes branch more frequently in the latter than in the former situation. The tubes carry the dentinal fibrils: that is the peripheral poles of the odontoblasts."

It is through these dentinal fibrils that nervous stimuli are transmitted to the pulp. Following the teachings of Miller and Black in the study of carious dentin, we note, among other interesting things, that caries progresses along the lines of the dentinal tubuli: that the form of the disintegrated dentin is that of a cone with the apex toward the pulp chamber and that the dentin is decalcified in advance of the penetration of the micro-organisms.

It is not likely that in the preparation of cavities we always remove the apex of the affected dentin. In deep-seated cavities is this advisable? In spite of the application of strong antiseptic agents recurrent decay may develop, and toxins finally reach the pulp.

If the remaining traces or thin layers of decayed dentin can be thoroughly dehydrated, the application of rosin solution may be of great service.

First, rosin being more or less a non-conductor, it reduced the shock of thermal changes, thereby lessening the tendency to secondary growths or deposits within the pulp chamber that are so noticeable under large metallic fillings, especially under large gold inlays.

We are taught that the decalcified dentin that is to be found just in advance of the micro-organisms in carious dentin furnishes food for the invading host. If the remaining decalcified dentin be saturated with rosin, I imagine the cost of living in that region will become prohibitive. However, if the rosin solution reaches the farthest boundaries of the decalcified dentin through the infected area, then the micro-organisms within the tubuli will have been engulfed within the rosin solution, and unless the bacteria are able to liquify the rosin, they will forever be inhibited from further activity, be they arobie or anerobic, in active or spore form. I need only mention the antiseptic properties of the chloroform.

This you will admit would be a very desirable condition in which to have a layer of decayed or decalcified dentin over the pulp, where the removal of the layer of decay would mean the exposure of the pulp.

The most satisfactory results that I have had in capping pulps has been to flow a rosin solution over the exposure, evaporating the chloroform with warm air, then cause a very thin cement to flow over the floor of the cavity and the thin coat of rosin, and allow it to harden, being careful to avoid pressure of any kind on the cement until quite hard.

This practice has been confined to quite small and recent exposures. Not the least satisfactory use of the rosin solution is after more or less thorough drying of the cavity the application of the rosin prior to the insertion of gutta-percha fillings either as a temporary or permanent filling.

On the removal of a temporary stopping of this nature that has been in place a week or a month, the decayed dentin that may have for any reason been left in the cavity will be found noticeably tough and hard and dry, due to the presence of the rosin and the sensibility of the dentin will be materially less, showing that the dentin has been free from the irritating effects of acids, or in other words, the fibrils have been in a state of comparative rest. And after all is said, the chief function of the surgeon is to remove the irritant and place the affected region at rest to the end that nature may perform a cure.

We now come to the consideration of the time-worn subject of root-canal filling. Let us not undertake to discuss the treatment of root-canals preparatory to filling further than to say that no root-canal is properly prepared for filling unless a fine paper canal dryer, as furnished us by the dealers, can be passed to or near the apical foramen.

If possible, is it desirable or necessary that the tubuli be sealed?

Dr. Hermann Prinz, whom I regard as one of the foremost among our scientific research workers, said in a paper read before the St. Louis Dental Society, September 2nd, 1912: "If the canal is not filled perfectly serum will seep into it from the apical tissues. The serum furnishes nutrient material for the micro-organisms present in the tubuli of a primarily infected root-canal."

The dentin is traversed by dentinal tubuli which number from 25,000 to 30,000 to the sq. millimeter. The pulp in situ sends protoplasmatic processes into these tubuli, and is connected with the peripheral tissues by arteries, veins, and nerves which pass through the main foramen and a number of small foramina (usually 2-7) present in the apex of the tooth. According to Fischer these accessory foramina are found in about 90% of all permanent teeth. These ana-

tomic facts are not sufficiently emphasized at present. Their significance is of great importance for the full comprehension of the pathology of secondary infection.

In an incipiently infected root-canal these dentinal tubuli and the small foramina offer ready hiding places for various forms of pathogenic bacteria.

After exhausting the nutrient material the bacteria become attenuated or they assume restive forms. If the tubuli and the foramina are tightly sealed, these enclosed bacteria must necessarily remain permanently confined in their lodging places, while, if the root-canal filling leaks, the seepage of serum furnishes fresh material which offers excellent opportunity for their renewed activities.

By continuity this secondary infection spreads along the lines of least resistance, i.e., toward the apex, and finally reaches the pericementum. This tissue protects itself against the invading foe by a reactive inflammation which results in the production of a fungus growth known as a granuloma, or in the past, as the abscess sack or pyogenic membrane.

For years the enclosed bacteria may remain dormant. At the slightest provocation, however, over-exertion, a clot, increased blood pressure, lowered vitality or some other cause, they may assume a most virulent activity, resulting in the production of the so-called subacute abscess. Based upon this supposition we are able to furnish a plausible explanation of how these obscure secondary abscesses occur about the devitalized teeth which at one time were pronounced cured.

In one of the most profound papers given to the dental profession on mouth infection, Dr. Rhein says: "Unfortunately as a profession we must admit that most of the causes of blind abscesses are the results of imperfect dental operations. In some cases they may be the result of bad judgment on the part of the operator: in others they may be due to ignorance and incompetence, but a very large number of cases are attributable to the failure of the educated dentist to give the time needed to perform an aseptic operation and have the field absolutely free from the possibility of future infection. This is absolutely nothing short of malpractice when done by a dentist who knows."

We have the testimony of several investigators to the effect that it is possible to sterilize the root-canal proper, but it is an impossibility to sterilize the infected dentin of a tooth while it remains in the mouth.

The microscope and the culture media have shown us conclusively that we have been and are now leaving enormous numbers of micro-organisms within the body with a more or less available route open to the circulatory system where they may reach any part of the body, carrying destruction to those organs or parts that may offer the most attractive lodging place.

A most significant fact must be borne in mind in regard to the devitalized dentin. There is no blood current to assist in the struggle. The dentine has absolutely no power to assist in repair. No granulation nor scar tissue—nothing but an inert tubular mass infected by millions of toxin producing micro-organisms. We must make of this infected tubular mass an inert harmless and stable body, including the effective closing of the numerous foramina to the end that nature may be able to envelop the root mass in a healthy and vigorous peridental membrane that the tooth may serve its several useful purposes for a number of years.

Most of us have at one time or another shared in the opinion that what the root-canal may be filled with mattered but little.

The radiograph in the hands of the advanced dental practitioners has brought to light evidence sufficient to prove the fallacy of such an opinion. It does matter as to the material: it does matter as to the manner of placing the material in the canal. The matter of prime importance being the sealing of the more or less numerous foramina, and, as we have no assurance that all the foramina in a given root-canal are located near the apex, it becomes our duty to seal minute canals or openings, that owing to physical condition we are unable to see.

Have we a root-canal filling material that will meet the requirements indicated above? We have three that may be considered. Gutta-percha and chloroform in combination: paraffin as advocated by Dr. Herman Prinz and Dr. Dunning, and the combination of rosin and gutta-percha.

With the gutta-percha cone and chloro-percha you are quite familiar. We know of many successes as well as of many unhappy failures with this root filling, sometimes due to faulty manipulation, but often due to the fact that the root-canal filling has shrunk sufficiently to admit body fluids to the canal or permit the egress of the micro-organisms that infest the tubuli, and in addition the gutta-percha root-fillings are often found to be saturated with

decomposed and odoriferous substances that we are altogether too familiar with.

The paraffin root-canal filling as advocated by Dr. Prinz and Dr. Dunning has many attractive features and time may prove it a most, if not *the* most acceptable root filling. I have not always succeeded in getting the paraffin to the apex of the roots of upper teeth. If the wire is too hot the paraffin will collect about the shank of the instrument, and if not hot enough it does not flow to all parts of the canal. The melted paraffin will, however, follow the paraffin oil into the tubuli and foramina if treated properly. It will take time to prove its permanence within the body. Our previous experiences and the experiences of the surgeon have made us a little shy on this point.

The technic of the rosin-gutta-percha root filling is simple, easy, quick and sure to seal all tubuli and foramina *that are open*. Before proceeding with the filling of the root canal all instruments, cotton, paper points, gutta-percha points should be placed in the steam chest. Super heated steam being the most effective sterilizing agent. After steaming the proper length of time the steam is shut off from the chest. This soon dries the instruments and points and cotton broaches. The gutta-percha and paper points after cooling in the basket have lost none of their desirable properties.

I have said that the root canal should be the general shape of the paper root-canal driers as furnished us by the dealers. In addition to this general form, have the mouth of each canal a decided saucer shape. This will facilitate the placing of agents or instruments to or near the apical foramen.

The first step then is the complete dehydration of the dentin, using acetone as advised by Dr. Prinz, as the dehydrating agent. After flooding the canal with acetone use the paper points liberally until the canal is entirely free from moisture. Follow this with warm air. Then hold a warm wire in the canal for a minute or two, being careful the wire is not hot enough to scar any part of the canal.

Right here is where many root-canal operations fail. The canals and tubuli must be as dry as it is possible to make them, bearing in mind that it is possible to do damage by overheating the root.

Now flood the dry root-canal with the thin rosin solution, pumping it in with a wisp of cotton on a broach. When the canal is full of the solution pass a fine wire or broach to the

end of the canal. Work out all of the air that may be trapped therein. This is of vital importance.

After the canal has been flooded or pumped full of the rosin solution dip the cotton and broach that is being used into or pick upon the cotton Bismuth oxide Hydrates. Work this into the rosin that is already in the canal. This is not essential to the preservation of the filling, but makes a more distinct picture of the finer points when the X-ray is in use.

The canal point should be made of base plate gutta-percha. Should carry no drugs or any additional element that will have a tendency to weaken or reduce the strength or rigidity of the cone, because we wish the gutta-percha to dissolve rather slowly at the periphery while the attenuated centre retains rigidity sufficient to permit of being pushed along.

Select a gutta-percha cone that will reach to or near the end of the canal, holding the cone with a fine foil carrier and pass the cone carefully and surely about *half way* into the canal, pumping the cone up and down in the canal usually from forty to sixty times, and, as it dissolves in the chloroform advancing the cone farther toward the apex.

The pumping motion forces the rosin solution farther into every opening. The chloroform at the same time dissolves the periphery of the gutta-percha cone which, becoming more and more attenuated, slips farther toward the apex, surrounding itself with a mixture of gutta-percha and rosin. The rosin seals the tubuli and at the same time causes the gutta-percha to stick tight to the pulp walls and makes the gutta-percha more stable and proof against the action of body fluids or substances.

If this does not leave the large end of the gutta-percha cone at or near the end of the canal, place a small cone alongside or on the first one, then with a cold steel plugger point that will go into the canals, gently pack the mass into the canal, using warm air to soften the protruding gutta-percha if necessary.

This packing forces the semi fluid (chloro-percha and rosin) into the unknown canals and pockets, and at the same time brings the surplus chloro-percha to the mouth of the canal, where it may be taken up with absorbent rolls or cotton.

In multi-rooted teeth complete the filling of each individual canal before starting another.

Rub the steel plugger points on paraffin cake to prevent the partially dissolved gutta-percha from adhering to the

instrument. The pulp chamber is to be filled with one of the cements.

You may ask: "Do you succeed in filling all canals and tubuli to the farthest extremity?" No, only those that are open and dry to the farthest extremity.

Are we likely to have inflammation in the periapical region following the closure of root canals in this manner?

The probability of inflammatory conditions in all cases depends upon the ability of the operator to read the pathological signs of each individual case and his skill and delicacy of touch in the manipulation of the various agents used.

Rosin and chloro-percha and cone is superior to chloro-percha in three ways. First, the rosin in chloroform penetrates deeply into the tubuli and foramina that chloro-percha will not enter at all, leaving within such tubuli or foramina upon the disappearance of the chloroform, a more or less solid, inert, insoluble substance that enmeshes the contents and seals the lumen of such tubuli or foramina.

Second, the rosin and chloroform causes the gutta-percha in whatever form it may be applied, to adhere closely to the walls of root canal or cavity. Third, the incorporation of the rosin in the freshly made chloro-percha makes an unshrinkable and impervious mass about the gutta-percha cone. If gutta-percha and rosin be dissolved in chloroform and left in an open dish or tube to dry on solidly the rosin will rise to the surface and harden in a crust over the gutta-percha. When the mixture is made in the root canal as has been suggested, the rosin in solution is held firmly in place in the dissolved gutta-percha between the canal wall and the cone in the centre.

We must be prepared to meet all sorts of morbid anatomical changes in the pulp chambers, root canals and the dentinal tubuli, due largely to constructive irritations long present in and about the tooth.

The slides that I shall show on the screen are selected, each one, to assist in demonstrating that the teeth which require root-canal treatment are, as a rule, far from being the perfect anatomical specimens that we see illustrated in text books. A tooth that has lost its pulp has usually been subjected for a long time to those conditions that bring about destructive as well as constructive changes.

The rosin solution does not show in X-ray pictures until mixed with gutta-percha, when it shows plainly in the canals and foramina, but not in the tubuli. Chloro-percha will not

enter the tubules: bismuth oxide does not dissolve in chloroform and therefore does not enter the tubuli. The blue stain used enters the tubuli with the chloroform and rosin solution, but does not show in X-ray pictures. So in order that we might have some visible evidence of the diffusibility of the rosin solution through the dentin I have resorted to color photography. To vouch for the correctness of the pictures, I have the original specimens here for comparison. One better versed than I in laboratory technic would certainly work out a more satisfactory scheme than this.

The pulp canals of a number of extracted teeth were opened mechanically—that is with burrs and drills—dehydrated and pumped full of the rosin and chloroform that has been stained blue. Then the gutta-percha cones were used as has been described above.

I do not claim that this procedure gives an exact reproduction of conditions in the tooth canal while the tooth is yet in service in the mouth. I do claim that the specimens and the pictures give a clear and understandable basis from which we can work a reasonable ideal. These slides are shown more to explain the theory than to prove results. There is a vast difference between filling a root canal in an extracted tooth and one in situ.

Post-Graduate Classes as Usual

NO better evidence of the unshaken faith of the future for good dentistry in Canada may be found than in the number of far-seeing men of the dental profession of this country, whose communications have given evidence of their interest, and who have more than half-filled the class in Dental Prosthetics, commencing August 16th and 28th, inclusive, at the Royal College of Dental Surgeons, Toronto. Perhaps this fact may not seem extraordinary when one considers the place that dentistry is filling in the public eye to-day. The new universally organized clean-and-healthy mouth movement is reaching rapidly into the lives of every man, woman and child in Canada and the United States. The medical profession are, as a body, including a careful examination of the mouth in diagnosis. The recent far-reaching development, giving dentistry its rightful place in the army, and the growing prominence given to great educational oral hygiene, and latterly, exhibits of good prosthetics (i.e., at the Panama Pacific Exposition)

are only a few of the outward manifestations which are resulting in the development of a fine, discriminating sense in the public, which demands prosthetic dentistry which is efficient, sanitary, unobtrusive, and non-injurious to the remaining teeth or the tissues of the mouth; and it is only but a short time before the ordinary clumsy "plate" of to-day will be extraordinary by its absence, as well as the absence of those who have lacked the foresight to place themselves in a position to render the up-to-date service.

Nobody may gainsay that the post-graduate school, in a fine and completely equipped building, under competent instructors, in the society of fine types of men imbued with one object, is the only possible and economic method of mastering the theory and fingercraft of the up-to-the-minute dentistry.

Comments such as, "Would like to take it over again," "More than paid for itself," "Ideas received most valuable," "After ten years' practice, helped me wonderfully," "Of inestimable value to me in practice," "Do not hesitate now to attempt any and all cases," "Good-fellowship of members of the class and instructors," "Impression-taking and Gysi articulation worth many times the course alone," "Far better service and double fees," reflect in a measure the feelings of the members of a similar class held under the same management in 1914.

The instruction offered in the class forming will be of such a character as to place every member in a position to begin immediately on his return, with utmost confidence, the latest and best methods of impression taking (Green and modifications, the astonishing results of which are becoming widely known), sanitary and efficient removable-bridge-partial-dentures (chiefly skeleton and of metal, replacing clumsy rubber dentures), manipulation of plaster, vulcanite and other essential materials (with opportunity for exact tests of results, for which Dr. George H. Wilson of Cleveland will come specially to present by specially installed apparatus for that purpose), esthetics, or harmony between prosthetics and patient's general appearance (nothing more important from the practitioner's standpoint, especially in the case of lady patients), cost-keeping, office arrangement, and general conduct of practice in producing and recording the above in the most economic way by proper method and proper division of labor, producing the best result for the patient and the dentist himself. In this connection, Dr. Wallace Seccombe, Professor of Dental Economics, Royal

College of Dental Surgeons, has prepared and will deliver lectures, the subject matter of which will be of much interest to the class.

Those interested in this opportunity and in better prosthetic dentistry are urged to communicate with Dr. W. E. Cummer, 2 Bloor Street East, Toronto, at the earliest possible convenience, as the remaining places are being steadily reserved.

Abolish the "Comfort"---A Bad Habit Which Should be Stopped

MORVILLE RUTHERFORD, D.D.S., TORONTO.

THERE seems to be a feeling among mothers, and especially among young mothers, that when a child cries, if it is given a "comfort" to suck everything possible has been done to soothe it. Infants acquire habits very readily, and once acquired, they are difficult to break. If you rock your baby to sleep, for instance, after a few times you will find it hard to put it to sleep without rocking. The same applies to singing children to sleep. All such devices are means of focussing the babe's attention until overcome by sleep. The "comfort," of all habits, is the most filthy, the most dangerous and the most unpardonable. Every nation should legislate against them and their manufacture should be prohibited.

No mother would think of taking her babe to a place where there is any infectious disease, but she overlooks the great dangers from infection to which the "comfort" exposes her child. This article is often picked up from wherever it may chance to lie, no matter in what exposed spot—it may even have been lying on the floor, or perhaps have fallen from the carriage on to the sidewalk.

Again, many mothers wet the "comfort" in their own mouths before giving it to the baby. This is especially dangerous, as the mother may be a "carrier" of some infectious disease germs, and, as the "comforts" are generally used with infants who are in a weakened condition, they are very susceptible to infection. Moreover, the child is

[Dentists have been known, before they had children of their own, to express views somewhat similar to those of the Essayist, but in later years have permitted the use of the "comfort" in their own home. Oral Health will be glad to publish the views of all such "fathers" who would justify their "change of heart," or of others who would further fortify the position taken by the Essayist.]

frequently given the "comfort" to send it to sleep, and when it does so, the comfort drops from its mouth, to become a roost for swarms of flies, perhaps just come from some nearby soiled napkin, or other filth. If, as is frequently the case, the mother rushes to the child with this fly-infected "comfort" the moment that the infant's cries show it to be awake, we can easily see the terrible danger of disease from the misguided use of the article.

A SOURCE OF INFECTION.

It does not require scientific knowledge, simply plain, serious thought, on the matter, to realize that the "comfort" is very often the source of the transmission of germs of disease, and is a most filthy habit. It is intended, of course, to soothe the baby; but is only used because it has become a *habit* with the infant. If it were never given it would never be necessary.

A rubber nipple for a "comfort" or a feeding bottle soon degenerates and becomes bad—due to light, heat, diet, etc., and becomes an active source of irritation to the tissues of the mouth and throat, which may soon become poisoned and inflamed. Red spots appear, and later on, join into a large infected area, which is very sensitive to the touch, and the child will shrink on examination.

These tissues, i.e., gums and cheeks, will be hot, red and dry, and this condition may be followed by deranged digestion, vomiting and diarrhœa. When like this, or even just slightly irritated, the child will be more open to infectious diseases, of which a cold is a good example.

What good can be got from a "comfort" compared to the chances of laying the child thus open to infection? Does it stop its fretting? No. Instead, it will generally increase it—not just at first, but in a few minutes. Sucking a "comfort" will soon cause fatigue, and will tire the brain of the child, making it more irritable than before. For example, if you chew gum, you will notice how it will tire you out, also that continual chewing will give you that feeling of a hard lump back of the throat, like indigestion, caused by the continual swallowing of unnatural flow of saliva and the moving of the jaw. A man sucking a dry pipe will get the same sensation.

Think how tired the baby gets with a "comfort" in its mouth half or more than half the time. This instrument might far more properly be styled a "*dis-comfort*."

MOUTH ARCH IS CHANGED.

Then more than this great danger to the child from infection, think of the change in the appearance of the child. From having a normal, healthy and correctly shaped arch, it may grow up to have a mouth with the upper, front teeth extending away out on the lower lip, with a lack of development and growth in the upper jaw, and a short, tight upper lip, predisposing towards mouth breathing and all its consequential irritations. The mouth arch also becomes narrowed, giving the face a gaunt, idiotic look, and the mouth a poor set of masticatory apparatus for the rest of its days.

There is no case where a "comfort" is a particle of good, nor any shape or style will excuse its use. It is a dirty, unsanitary thing, forced into baby's mouth by its mother, the one person who surely its best interest at heart, under the mistaken idea that baby needs it, although it is never recommended by dentist or physician. The sooner a mother realizes the harm she is doing by its use, she will surely throw it away, and give the baby a chance to grow into a clean, healthy child, and be an ardent advocate of "Abolish the Comfort."

Report of the Ontario Oral Hygiene Committee of the Ontario Dental Society

TO the Members of the Ontario Dental Society:

In February, 1914, the following members were elected as the Executive of the Oral Hygiene Committee of the Ontario Dental Society: Doctors W. Cecil Trotter, R. G. McLaughlin, A. D. A. Mason, R. J. Reade and C. E. Pearson. These members elected at the annual meeting of the Ontario Dental Society, together with the chairmen of the several sub-committees throughout Ontario, make up the Executive of the Oral Hygiene Committee for the Province of Ontario.

The Committee presents the following report for the year 1914-15:

On March 17, 1914, the members of the Executive Committee met and elected the following officers for the year: Dr. R. G. McLaughlin, Chairman, and Dr. R. J. Reade, Secretary-Treasurer. The resignation of Dr. C. E. Pearson as a member of the Executive was received and accepted. The Committee then unanimously elected Dr. H. E. Eaton to fill the place vacated by Dr. Pearson.

During the year eight meetings were held.

There are at present twelve sub-committees working in the Province of Ontario, namely, at Toronto, St. Thomas, Ottawa, Guelph, Stratford, Kincardine, Berlin, Gananoque, Cornwall, Georgetown, Central Ontario and Hamilton.

Following the instructions of the Ontario Dental Society, the Executive of the Oral Hygiene Committee made arrangements to hold an Oral Hygiene Conference in Toronto. The Convention is for the purpose of showing those who attend the Convention the manner in which the Oral Hygiene work is conducted in Toronto in the Public Schools, in the Public Dental Clinic, and in the hospitals; and as there are always some difficulties that must be overcome before the work can be introduced into the various sections of the Province, one of these difficulties forms a subject of a paper. The delegates then discuss all their difficulties in order to bring a solution of the matter before the meeting.

This year the Conference was held on November 10, 1914. The first part of the programme was a visit to the school clinics. At 10.30 in the morning automobiles were in attendance at the Royal College of Dental Surgeons to take the delegates to Earls court School. Under the direction of the late Dr. W. H. Doherty, Toronto Public School Dental Inspector, the method of carrying on the work at the clinics, and of keeping records, was explained to the delegates. After a very interesting and profitable morning spent at the school, the delegates were taken to the Canadian Club for lunch.

After lunch the Municipal Dental Clinic was inspected. Dr. J. A. Bothwell, Municipal Dental Inspector, explained to the delegates the work the clinic was undertaking, and the methods of carrying on the work. He pointed out that extractions for school children were not performed in the schools, but that one day a week was set apart to have that work done in the Municipal Clinic.

From the Municipal Dental Clinic the party was conducted to the Royal Ontario Museum, Bloor Street, where Dr. McLaughlin, the Chairman of the Ontario Oral Hygiene Committee, had made arrangements to have the party personally conducted through the Museum. After a most interesting and profitable time spent in the Museum, Dr. W. E. Struthers received the delegates at his office in the City Hall.

The evening proceedings began with a dinner tendered to the visitors at the Walker House. The following members of the different Oral Hygiene Committees sat around

the tables: Doctors W. Cecil Trotter, Toronto; A. J. Broughton, Toronto; Geo. W. Grieve, Toronto; R. G. McLaughlin, Oliver Martin, Ottawa; W. R. Greene, Ottawa; F. C. Husband, Toronto; J. A. Bothwell, Toronto; F. E. Bennett, St. Thomas; J. A. Bothwell, Stratford; O. A. Marshall, Belleville; J. P. Marshall, Toronto; H. E. Eaton, Toronto; P. T. Coupland, St. Mary's; E. H. Eidt, Stratford; M. A. Ross Thomas, London; S. P. Reynolds, London; A. E. Santo, London; W. A. Black, Toronto; J. Frank Adams, Toronto; A. W. Ellis, Toronto; F. C. H. Briggs, Hamilton; D. Baird, Toronto; W. M. Wunder, Toronto; W. E. Willmott, Toronto; A. E. Rudell, Berlin; R. D. Jarvis, London; A. E. Grant, Toronto; W. H. Doherty, Toronto; A. H. Mabee, Gananoque; J. F. Simpson, Trenton; R. J. Reade, Toronto; R. T. McDonald, Hamilton; Wallace Seccombe, Toronto; A. E. Webster, Toronto; C. A. Kennedy, Toronto. There were also present Dr. W. E. Struthers, Chief Medical Inspector of the Toronto Public Schools, and Drs. J. Wright Beach, D. A. Burton Eshelman, and J. A. Frankenstein, from Buffalo, N.Y.

After dinner, the Chairman, Dr. R. G. McLaughlin, addressed the meeting, giving some interesting and encouraging information to the delegates regarding the past work and the future efforts of the Committee.

Following the Chairman's address, there was a consideration of Oral Hygiene with regard to the soldiers. At that time there were many desirable men of experience rejected on account of the condition of their mouths, so the following resolution was passed and unanimously carried by the meeting: "Moved, That the Executive of the Oral Hygiene Committee of the Ontario Dental Society be instructed to approach the proper military authorities of the Province of Ontario to endeavor to make satisfactory arrangements whereby the teeth of recruits for military service be put in proper condition to meet the requirements of the military department, when the remedying of such defects will be the means of having their applications accepted. The dentists of Ontario will undertake such patriotic service at their own expense, to increase the supply of recruits to defend our Empire, and to uphold the highest ideals of liberty."

The Chairman then called upon Dr. J. A. Bothwell, Superintendent of the Municipal Dental Clinic of Toronto, to address the meeting regarding the work done at the Clinic.

Dr. W. H. Doherty, Dental Inspector of the Toronto

Public Schools, next explained the methods of procedure adopted in carrying on the School Dental Clinics.

Dr. W. E. Struthers, Chief Medical Inspector of the Toronto Public Schools, gave a short humorous address and spoke very sympathetically of the work being done by the Ontario Oral Hygiene Committee.

Dr. J. A. Bothwell, Stratford, then read the paper of the evening, "The Plan of the Work to Meet the Difficult Problem of Rural Schools' Dental Inspection and Clinics."

After a general discussion, during which most of the delegates spoke of the pleasure and profit they had in attending the meeting and the pleasure of looking forward to the next Conference, the meeting adjourned.

In accordance with the instructions of the Conference to see what could be done regarding the teeth of the soldiers, your Committee had an interview with Major-General Hughes. The following is the report of your Committee:

"Your Committee, according to instructions, arranged for a conference with the Hon. Major-General Hughes, Minister of Militia.

"We discussed with the Minister the subject of army recruits who have been rejected solely because of defective teeth, and intimated that the dentists of Ontario would, under proper conditions, be willing to care for such, put their mouths in an acceptable condition, if they were not able to pay the regular fee.

"The Minister expressed his sympathy and interest in the matter, but, owing to lack of time, was unable to go personally into the matter, and especially requested the Secretary to write him, stating what was required, so that he might have the matter before him to consider quietly. He also asked Col. Fotheringham to go into the matter with us, and, if possible, find a solution. Your Committee submitted to Col. Fotheringham the following propositions, which he seemed quite agreeable to and promised to have submitted and carried out, if possible:

"RE DENTAL SERVICES FOR ARMY RECRUITS.

" "1. Dental surgeons of Ontario are willing to give their services gratis to recruits who have been rejected solely because of defective teeth conditions, if such recruits are not financially able to pay the ordinary fee.

" "2. Such recruits to be given sufficient time to have teeth put in order and report for duty.

" "3. A dental surgeon to be appointed at each import-

ant recruiting centre, whose duty shall be to examine the mouths of such recruits as have been rejected because of defective teeth, or to have doubtful cases referred to him for final decision, and to have such sent to some local dentist to have teeth put in acceptable condition.

“4. Dental surgeon who is thus appointed is to rank as Hon. Captain, and be paid as such.”

“As a result of this conference, Col. Fotheringham began communications with Ottawa, the result being that an appropriation was set aside to carry on the work in the different parts of Canada. The desires of the members of the Oral Hygiene Committee being in this way more than fulfilled, the Executive Committee thus concluded the work given to them. Further work of obtaining a Dental Unit was then carried on by other committees in different parts of Canada.

During the year your Committee interviewed the Minister of Education for the purpose of seeing what advance could be made in reference to increasing the facilities for Oral Hygiene work in the rural districts of Ontario. A committee, consisting of Doctors McLaughlin, Doherty, Seccombe, Reade, Trotter and Eaton, had an appointment with the Minister of Education at the Parliament Buildings, Toronto. The following is a report of the Committee, together with a reply received from the Department of Education.

All the members of the Committee spoke on the question, and the Minister requested the Committee to put their ideas in form and write to him concerning their request. The following memorandum was sent to Dr. Pyne:

“The Hon. the Minister of Education, Parliament Buildings, Toronto, Ont.:

“Dear Sir,—A representative deputation of the Provincial Dental Association of Ontario has been requested to urge upon you the necessity of some practical instruction being given the school children of the Province on the subject of Oral Hygiene.

“The growing importance of mouth conditions in relation to the general health, as recognized to-day, both by the medical fraternity and the laity, make it imperative that the boys and girls of our schools should have some practical knowledge of these conditions.

“It is true that in the larger centres, like the City of Toronto, the matter is receiving some considerable attention, but in the purely rural districts the subject is entirely neglected.

“Therefore, we respectfully urge that the Department issue to every teacher in the Province a specially prepared Hand Book on Oral Hygiene.

“Such a book could be so written and illustrated as to be easily understood by the teacher, and be of real assistance to her in impressing on the pupils the *importance* and *care* of the teeth.

“It is understood, however, that no suggestion is made to place this subject on the regular curriculum, but rather one to be taken up by the teacher once or twice a month as a relaxation from the regular course of studies.

“We trust that this important subject will receive your hearty co-operation and assistance in bringing this matter to a successful issue.

“We have the honor to be,

“Most sincerely yours.

“Signed by the Committee.”

Reply to the above letter:

“Dear Sir,—I am directed by the Minister of Education to acknowledge the receipt of your letter of the 28th ultimo, and to express his concurrence in views of your Committee as to the necessity for impressing upon the pupils of the schools the importance and care of the teeth. He directs me, however, to call your attention to the fact that he authorized for use in the Fourth and Fifth Forms of the Public and Separate Schools, “The Ontario Public School Hygiene,” and has recommended for use in the Third Form of the same schools ‘Hygiene for Young People’ and ‘The Story of the Human Body.’ In the case of the last two books, a sufficient number of the book or books are to be provided in the school library for the pupils’ use, or to be bought by the pupils themselves, as the Board of Trustees may determine. Each of these books includes a chapter dealing with the teeth, of the character which your Committee commends. The subject of Hygiene is prescribed for each of the first four Forms of the Course of Study for the Public and Separate Schools, and may be added to the Course of Study in the Fifth Form at the request of the School Board, and with the Minister’s approval. The instruction in the first two Forms is to be oral, and in the case of the other Forms to be based upon a Course which involves oral treatment of the subject as well as the study of the textbooks.

“Under the foregoing conditions, the Minister is of opinion that adequate provision for instruction in Hygiene,

including the care of the teeth, has already been made in our schools.

“I have the honor to be,

“ Your obedient servant,

“(Sgd.) A. H. N. COLQUHOUN,

“Deputy Minister of Education.”

The reports received from the various Oral Hygiene Committees are very encouraging, and point to the fact that the profession is becoming very much interested in the education of the public in matters relating to Oral Hygiene. The report of the Elgin Committee points to the interesting fact that an outbreak of disease in the schools leads the way to the introduction of our work. It is not a matter of theory or speculation as to the good that may result from Oral Hygiene work, but it is a reality based on indisputable facts.

In Toronto the work is advancing steadily, and a dental clinic is now established in the Hospital for Sick Children, the General Hospital and the Western Hospital, under the charge of Dr. J. A. Bothwell, Inspector of the Municipal Dental Clinic.

During the year your Committee has had in hand the work of preparing a pamphlet to be published by the Ontario Government. The subject to be dealt with is “Teeth in Relation to General Health.” This pamphlet is now on its way to completion, and will shortly be in the hands of the Government.

BERLIN ORAL HYGIENE COMMITTEE.

We beg to submit the following report re Oral Hygiene in the City of Berlin.

It may be said that in Berlin some progress has been made along the line of Oral Hygiene in its relation to our public schools.

The private educational work of the members of the profession here is beginning to show fruit, and is having its effect on the minds of those in charge of educational matters.

The members of the Board of Education are broad-minded men who have realized the importance of Hygiene in the public schools, and, as a consequence, have engaged a school nurse for the coming year. This young lady is at present taking a special course to prepare her for the position which she has accepted, and we are very hopeful that much good will result from this appointment.

There has been formed a Mothers' Club in the city, which meets regularly, and several addresses have been delivered by dental and medical men to the mothers on the subject of Hygiene.

The Dental Charts have been hung up in the schools and are much appreciated by the Board and staff of teachers.

A great deal of work was performed for the recruits, and in fact every volunteer who was rejected on account of bad teeth had the necessary work done, and has since been accepted. Not one dollar was charged the soldiers for this work, and a great many more men were thus secured for the militia than otherwise would have been.

A. E. RUDELL, Chairman, L. A. KOEPEL, Secretary.

CENTRAL ONTARIO ORAL HYGIENE COMMITTEE.

Addresses have been given through the dentists at Women's Institutes and other gatherings on "Care of the Teeth" and "Dental Inspection of Schools." Also, lectures have been reported in the local press.

The Board of Trade are also getting interested in the subject of "Dental Inspection of Schools," the Stouffville Board of Trade having it up for discussion, and concluded that it was of vital interest to the welfare of the whole community.

DONALD C. SMITH, Chairman. H. N. WILKINSON, Secretary.

CORNWALL ORAL HYGIENE.

We have distributed cards and literature to school children and daily strive to broaden the scope of dentistry in our community.

W. B. CAVANAGH, Chairman, A. A. SMITH, Secretary.

ELGIN ORAL HYGIENE COMMITTEE

Since the last report of the Oral Hygiene Committee of the Elgin Dental Society, an important announcement is to be made.

Recent steps have been taken by the Board of Education of the City of St. Thomas in the adoption of Health Inspection of the Public Schools, and also the appointment of a competent nurse to take charge of the Dental and Medical Inspection of the children, the duties of the nurse to commence on the first of September.

This action was brought about by the school authorities recognizing the importance of a systematic health inspection, for during the last few months there have been outbreaks of contagious disease—influenza, diphtheria and

smallpox, which necessitated the closing of all the schools until the diseases were entirely suppressed.

By adopting this means of checking the development of disease, they feel assured that there will be no necessity of the pupils' studies being affected.

The members of the Dental Society have also been very active, and brought much pressure to bear in influencing the Board of Education to adopt Dental Inspection.

Great credit is due to the chairman of this committee, who is also the Chairman of the Board of Education, in so ably presenting the necessity of such inspection.

F. E. BENNETT, Chairman.

T. C. TRIGGER, Secretary.

GEORGETOWN ORAL HYGIENE COMMITTEE.

There is practically nothing to report for the last year. We have tried several times to get the work going in the schools, but this has been blocked every time. I cannot explain the circumstances here, otherwise than to say the time is not opportune, and as soon as it is a move will be made.

F. R. WATSON, Chairman.

F. L. HEATH, Secretary.

GUELPH ORAL HYGIENE COMMITTEE.

We are continuing our educational work with the public, and now we think results are showing. As a result of the examination of the children's teeth in some of the schools the teachers and parents are not only interested, but asking that this work be kept up as a part of the school work. This will, no doubt, have effect on the Board of Education, in the appointing of a school nurse.

Lectures have been given to school children and to graduating teachers of the Normal School, and adso to branches of the Women's Institute.

D. M. FOSTER, Chairman.

F. T. COGHLAN, Secretary.

OTTAWA ORAL HYGIENE COMMITTEE.

The Oral Hygiene Committee of the Ottawa Dental Society has not been active during the past year as a committee, and consequently has no report to make, but it is only fair to state that owing to the individual efforts of several members some very good and encouraging work has been accomplished, the results of which we trust will appear in next year's report. The School Clinic, towards which the committee were working last year, is now being successfully carried on with one chair in operation daily. Dr. Eaman in charge. The City Council has passed favorably on the establishment of a Municipal Clinic, which, however, could

not be put in operation this year owing to lack of funds, but will in all probability be established in the near future, as the need of such a clinic seems to be thoroughly appreciated and the sentiment in its favor very strong.

OLIVER MARTIN, Chairman.

M. G. McELHINNEY, Secretary.

STRATFORD ORAL HYGIENE COMMITTEE.

Our officers have changed this year. Dr. H. W. Baker is the Secretary, and Dr. J. A. Bothwell, the Chairman.

For this year Dr. Baker was appointed to deliver a course of lectures to the nurses in training at our General Hospital and has already done so.

Dr. E. H. Eidt was appointed to give an address to the students in training at the Normal School. Arrangements are now completed for that to be carried out early in May.

A good deal of interest has been aroused among the Mothers' Clubs in connection with the schools in regard to the care of the children's teeth. Our school nurse is doing some good educative work. Besides this, Dr. Eidt has delivered addresses before two of the clubs, and the Chairman gave one yesterday to the Mother's Club of Romeo School. Judging from the enthusiasm exhibited we are expecting that very soon the City Council may be approached by these clubs with a request for the establishment of a clinic. We are witnessing more of a desire to care for the mouths and teeth of the children.

J. A. BOTHWELL, Chairman.

H. W. BAKER, Secretary.

TORONTO ORAL HYGIENE COMMITTEE.

Report of Clinic Committee.

During the year 1914-15 your clinic committee has had little work to do, as the establishing of new clinics and the further developing of the work is well looked after by the Department of Public Health and Board of Education Dental Chiefs.

Since last year the Department of Health has entered a somewhat new field in the treatment of adults in the hospitals. Two Hospital Dental Services have been established and are now in a well organized condition. These clinics are in connection with the out-patient department of the Toronto General and Western Hospitals. They treat both out and in-patients. In the near future the department expects to take over the in-patient clinic at the Hospital for Sick Children and also to establish an out-patient clinic at St. Michael's Hospital.

Last year the Board of Education added several new clinics in different schools. They now number thirteen. It is also carrying on a systematic educational campaign. Your committee feels that a very good work is being done in Toronto and that the clinic work is being well looked after.

Dr. A. E. Webster, Chairman, Drs. R. G. McLaughlin, J. A. Bothwell, W. A. Black.

Report on Dietetics.

The committee on dietetics interviewed Miss A. Laird, Principal of the School of Household Science, University of Toronto, in relation to having lectures given to senior students of the school upon the subject of the relationship of dentistry to diet.

Miss Laird assured the committee of her sympathy and co-operation, and that upon securing the approval of the President of the University, she would arrange for such lectures.

Dr. W. Seccombe, Chairman, Drs. E. L. Gausby, F. C. Husband, R. J. Reade.

Lectures Arranged for 1915.

Mothers' Meetings.

St. Mathies' Church, Nov. 4, 1914—Dr. E. F. Arnold.

Church of the Holy Trinity, Nov. 25, 1914—Dr. W. E. Wray.

St. John's Church, Jan. 27, 1915—Dr. C. E. Brooks.

St. George's Church, Feb. 24, 1915—Dr. A. W. Ellis.

St. Philip's Church, Apr. 28, 1915—Dr. W. B. T. Amy.

Hospitals.

Western Hospital—Dr. H. Clarkson.

Wellesley Hospital—Dr. W. Seccombe.

Home for Incurables—Dr. A. S. Thomson.

Toronto General Hospital—Dr. Mason.

St. Michael's Hospital—Dr. McDonagh.

Grace Hospital—Dr. McLaughlin.

Methodist Deaconess Home—Dr. M. Donald Gordon.

Westminster College—Dr. I. H. Ante.

West End Y. M. C. A.—Dr. E. A. Grant.

Working Boys' Home—Dr. E. L. Gausby.

Berkeley St. Methodist Church—Dr. F. D. Price.

St. Nicholas Anglican Church—Dr. F. D. Price.

King St. Methodist Church—Dr. F. D. Price.

Dr. H. E. Eaton, Chairman, Drs. C. A. Kennedy, W. B. T. Amy.

Financial Statement

Receipts.

Cash Balance Last Statement	\$ 3.71
Bank Balance Last Statement	106 54
Cheque from the Ontario Dental Society	150.00
Sale of Dental Exhibit Charts	19.00
Sale of Dental Inspection Record Forms	2.25
Bank Interest	3.47
	<hr/>
	\$284.97

Disbursements.

Stationery and Sundries	\$ 4.55
Postage	26.87
Grand Union Hotel Co., Dinner to Delegates	51.00
Canadian Club, Luncheon to Delegates	21.60
Crescent Inn, Dinner to Executive Committee	3.50
E. London, Sending Out Annual Reports	2.00
M. S. Weir, Printing	82.00
Expenses in Connection with Seeing Major-General Hughes	5.44
Cash on Hand	4.20
Bank Balance	83.81
	<hr/>
	\$284.97

Assets.

Cash on Hand	\$ 4.20
Bank Balance	83.81
Dr. F. R. Thomas, Harrisonburg, Va., Owing for Charts	4.00
Dr. J. H. Frain, Norwich, Ont., Owing for Record Forms75
12 Sets of Dental Exhibit Charts	42.00
	<hr/>
	\$134.76

Liabilities.

Bills Not Rendered, Say	\$ 47.50
Surplus of Assets Over Liabilities	87.26
	<hr/>
	\$134.76

R. J. READE, Sec.-Treas.

We have examined the Books, Accounts and Vouchers of the committee, and hereby certify to the correctness of the above.

Auditor.

THE ORAL HYGIENE COMMITTEE OF THE ONTARIO DENTAL SOCIETY.

Executive Committee.—Dr. R. G. McLaughlin, Chairman, 54 College St., Toronto; Dr. R. J. Reade, Secretary, 2 Bloor St. W., Toronto; Dr. W. Cecil Trotter, Toronto; Dr. F. C. Husband, Toronto; Dr. D. M. Foster, Guelph; Dr. H. A. Parker, Gananoque; Dr. W. J. Bruce, Kincardine; Dr. J. A. Bothwell, Stratford; Dr. D. C. Smith, Stouffville; Dr. E. Kelly, Hamilton; Dr. A. D. A. Mason, Toronto; Dr. H. E. Eaton, Toronto; Dr. A. E. Rudell, Berlin; Dr. W. B. Cavanagh, Cornwall; Dr. F. R. Watson, Georgetown; Dr. Oliver Martin, Ottawa; Dr. F. E. Bennett, St. Thomas.

Berlin Oral Hygiene Committee.—Dr. A. E. Rudell, Chairman; Dr. L. A. Koepell, Secretary.

Central Ontario Oral Hygiene Committee.—Dr. D. C. Smith, Stouffville, Chairman; Dr. H. N. Wilkinson, Newmarket, Secretary; Dr. C. H. R. Clark, Newmarket; Dr. J. W. Barker, Cannington; Dr. R. M. Stewart, Markham; Dr. W. Adams, Whitby.

Cornwall Oral Hygiene Committee.—Dr. W. B. Cavanagh, Chairman; Dr. A. A. Smith, Secretary; Dr. O. L. Weaver, Dr. W. D. Knight, Dr. J. A. Lidell.

Elgin Oral Hygiene Committee.—Dr. F. E. Bennett, St. Thomas, Chairman; Dr. T. C. Trigger, St. Thomas, Secretary.

Gananoque Oral Hygiene Committee.—Dr. H. A. Parker, Chairman; Dr. A. H. Mabee, Secretary; Dr. J. A. Black.

Georgetown Oral Hygiene Committee.—Dr. F. R. Watson, Chairman; Dr. F. L. Heath, Secretary; Dr. L. L. Bennett.

Guelph Oral Hygiene Committee.—Dr. Douglas M. Foster, Chairman; Dr. F. T. Coghlan, Secretary.

Hamilton Oral Hygiene Committee.—Dr. Ernest Kelly, Chairman; Dr. Chas. H. Ross, Secretary; Dr. J. L. Kappeler, Dr. S. G. Alderson.

Ottawa Oral Hygiene Committee.—Dr. Oliver Martin, Chairman; Dr. M. G. McElhinney, Secretary; Dr. L. E. Stanley, Dr. C. H. Juvet, Dr. W. C. McCartney, Dr. A. E. McCordick, Dr. M. F. Cross, Dr. W. R. Green, Dr. J. J. Lacey, Dr. W. A. Leggo.

Stratford Oral Hygiene Committee.—Dr. J. A. Bothwell, Chairman; Dr. H. W. Baker, Secretary; Dr. A. E. Ahrens, Dr. S. B. Gray, Dr. D. R. Nethercott, Dr. E. H. Eidt.

Toronto Oral Hygiene Committee.—Dr. F. C. Husband, Chairman; Dr. C. A. Kennedy, Secretary; Dr. A. E. Webster, Treasurer; Dr. Wallace Secombe, Dr. R. G. McLaughlin, Dr. H. E. Eaton, Dr. W. A. Black, Dr. J. A. Bothwell, Dr. R. D. Thornton, Dr. R. J. Reade, Dr. A. J. McDonagh.

The Army Dental Fund of the Canadian Dental Association

THE Canadian military authorities, having become convinced that an efficient dental service is a necessity for the overseas forces, have organized the Canadian Army Dental Corps. The Government has made provision for part of the equipment of this corps, but much of what is essential, such as special surgical instruments, operating coats, towels, etc., must be provided from outside sources. With this purpose in view a Canadian Army Dental Fund Committee has been appointed by the President of the Canadian Dental Association with concurrence of Lieut.-Col. J. Alex. Armstrong, composed of Harold Clark, Chairman, C. V. Snelgrove, Treasurer; A. E. Webster, Secretary, of Toronto; F. J. Coghlan, Guelph; Wallace Seccombe, F. C. Husband, R. W. Hull, C. A. Kennedy, W. B. T. Amy, of Toronto; G. F. Bush, Winnipeg; F. W. Barbour, Fredericton; Jos. Nolin, Montreal; C. S. McArthur, Truro; Geo. Telfer, Vancouver; A. D. Callum, Calgary; J. S. Bagnall, Charlottetown; F. C. Harwood, Moose Jaw.

The minimum amount required will be \$10,000, and out of this fund the Army Dental Surgeons will be fully equipped with everything necessary for the comfort of themselves and their patients.

Although this appeal is being made to the dentists throughout Canada, it is expected that many outside the dental profession will contribute to this urgently needed fund.

An Appeal to the Dentists of Canada

The Army Dental Fund Committee has issued the following appeal to the dentists of the Dominion:

A crisis in the history of Canadian dentistry is upon us! Shall we as members of that profession grasp the significance of this opportunity and reap the reward of a higher citizenship, or will we let it pass and lose our rightful place in the affairs of the nation?

After many years of patient endeavor the dental profession has at last received recognition from the military authorities. An Army Dental Corps has been formed and sailed on the nineteenth of June for overseas service.

The personnel of this Corps, we are sure, is a gratifica-

tion to the profession at large, and they will no doubt win honor for themselves as well as for their fellow workers at home. But however forceful in character or skillful in practice these men may be, they cannot give their best services to their country with inadequate equipment, and unfortunately the multiplicity of details and enormous expenditures that confront the Government preclude the possibility of all branches of the service being equipped with anything more than is absolutely needed, so that much of what is necessary must be supplied by outside sources.

Every dentist we are sure is anxious that the Army Dental Corps shall be supplied with a thoroughly efficient equipment, and to give each member of the profession a chance to help, a Canadian Army Dental Committee has been created to establish an Army Dental Fund for the purchase of special dental surgical instruments, operating coats, books, towels, etc.

The Army Dental Committee has considered it advisable to ask the dentists for \$10,000 at least, and urgently solicits their co-operation in raising this amount. Heretofore many of us no doubt have contributed to other patriotic funds as a duty, but to contribute to this fund is not only a duty for the dentist, but should be a privilege.

The committee has already purchased a considerable quantity of supplies which were sent with the Army Dental Corps when they sailed on the nineteenth of June. Additional supplies will be sent as the money is received.

Local committees are being organized to look after subscriptions in each district. All subscriptions, unless otherwise directed, will be acknowledged through the dental magazines.

This is a great opportunity for the dentists of Canada to show that they are capable of doing a big thing in a big way.

Sorel's Stone for Casts

HOWARD J. MERKELEY, D.D.S., WINNIPEG.

IN the following article a formula is given which, in the hands of the writer has proved very satisfactory.

For some time the formula, as adapted from Eskel by Dr. Prothero was tried, but a number of faults were manifested. To overcome these defects a series of experiments were carried on, with the assistance of Mr. R. N.

McKinnon, with the result that the formula as here given has been found very satisfactory in a wide variety of cases.

To produce the stone a powder and a liquid are mixed. The powder consists of 15 parts pumice, 15 parts magnesium oxide (heavy) and one part litharge. The liquid is a saturated solution of magnesium chloride.

To pour casts, paint the impression with a few coats of good sandarac. This will put a high polish on the cast as well as facilitate the separation of impressions taken in compound.

Incorporate the powder with the liquid, stirring thoroughly until a stiff, almost plastic, mass is produced, it will be too stiff to pour, so work to place. Do not wet the impressions previous to pouring or the casts will be ruined.

Setting, sufficient to separate, should result in 10 to 12 hours, but is continued for probably a month. In the case of Gilmour bars, no wire dummies need be used to produce the bars, simply pour in stone, it is more exact.

The litharge is added to the above to aid in the separation of the cast from the denture, the sulphur in combination with it producing a coating of lead sulphide on the surface of the cast, so that even large undercuts do not hinder separation after vulcanizing.

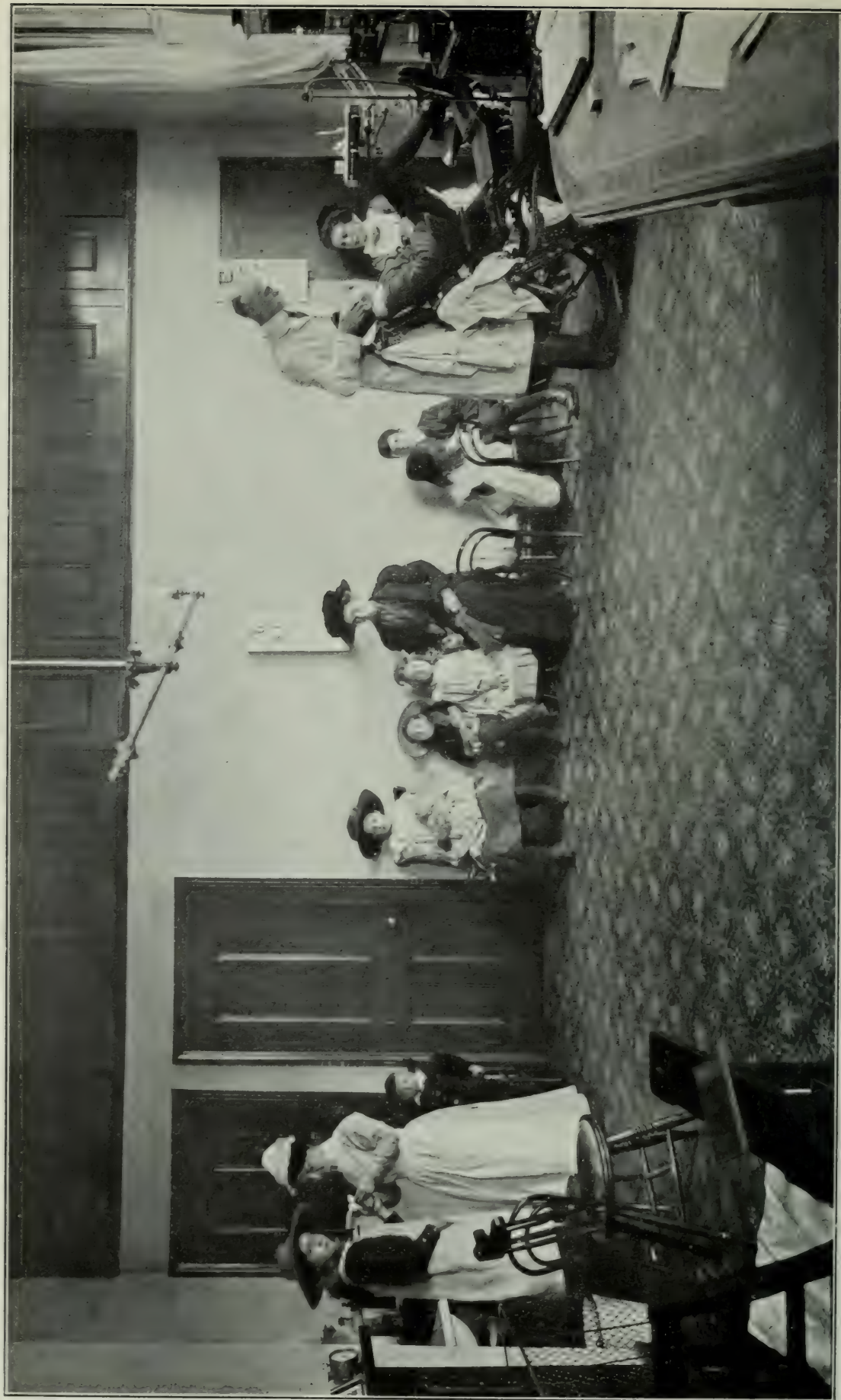
Care should be taken that the magnesium oxide is fresh, also be sure the magnesium chloride solution is a saturated one.

Obituary

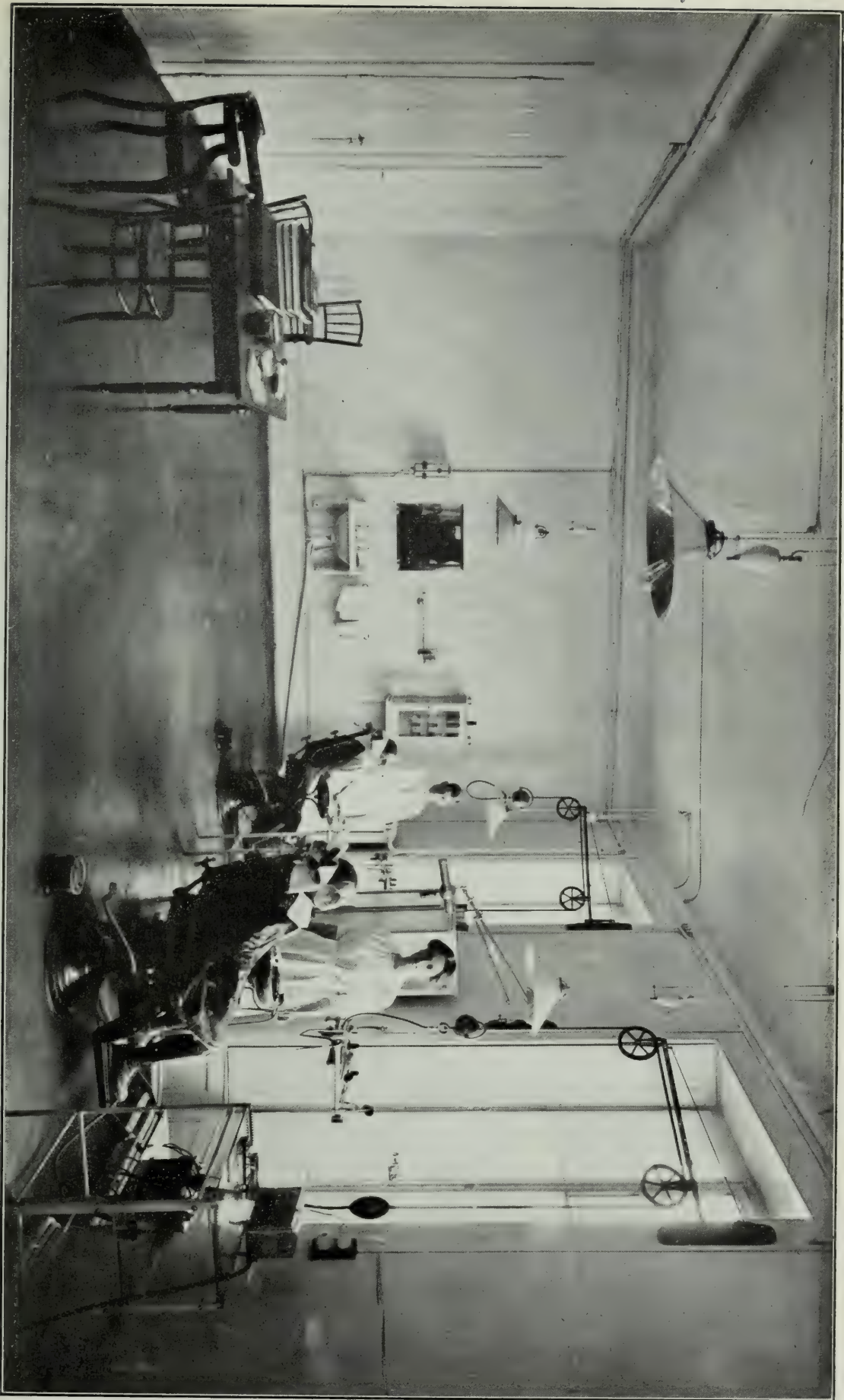
THE death of Dr. Robert H. Winn occurred in New York City at his residence, 501 West 113th St., on May 22nd, 1915. He had been ill for some time, and the end was not unexpected. He was the eldest son of the late Dr. T. B. Winn of Nassagaweya, Ont. He graduated in 1888 from the Royal College of Dental Surgeons, and practised in the east end of Toronto for several years before moving to New York City, some fifteen years ago, where he carried on a very successful practice.

A member of the Masonic Order, being also a member of Mecca Shrine, New York City.

He leaves a wife, mother, three sisters and a brother to mourn his loss



General View—Deptford Children's Health Centre



Canton Dental Clinic, Geneva, Switzerland

ORAL HEALTH

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A Monthly Journal devoted to the furtherance of individual and community health by the advancement of Dental Science and Oral Hygiene.

Published in the hope that it may reach those with an open mind, a willing heart and a ready hand to serve.

SUBSCRIPTION PRICE - \$1.00 PER YEAR.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, 229 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to the Publishers, Oral Health, 229 College St., Toronto, Canada.

Vol. 5

TORONTO, JULY, 1915

No. 7

EDITORIAL

The Late Dean Willmott

DEAN WILLMOTT quietly slept away at half past four upon the afternoon of Monday, June Fourteenth, 1915.

Although of exceptional physique, a life voyage of seventy-eight years, less one day, left Dean Willmott without sufficient strength to rally from the effects of an operation which had been performed about two weeks earlier.

Dr. Willmott was a christian gentleman. His great achievements were due, not to his marked ability alone, but to the embodiment, in his everyday life, of Christian principles and his high regard for truth. He exerted a marked influence upon the hundreds of students who have passed through the Royal College of Dental Surgeons at Toronto. This influence is not to be measured alone by the relationship of teacher to student—it was deeper and more lasting, because of the principles for which he nobly stood and the high moral standards to which he faithfully adhered.

The influence of the christian character of Dean Willmott upon the Royal College has been inestimable during

the years that are gone, and though he has now "passed over" the inspiration of his useful life will live as an active force through the days that are to come.

Floral tributes were sent by a number of dental organizations, including the Canadian Dental Association, the Ontario, Toronto and Alberta Dental Associations, Board of Directors and Faculty of the Royal College of Dental Surgeons, the Canadian Oral Prophylactic Association and the Canadian Army Dental Corps.

The sincere sympathy of the entire dental profession will go out to Mrs. Willmott and Dr. Walter Willmott and the other members of the family.

Grading in Toronto Public School According to Oral Conditions

FOR the purpose of developing a greater interest among school pupils in the maintenance of a cleanly condition of the teeth and oral cavity it has been arranged by the Toronto Board of Education that periodical examination be made and each pupil graded according to the daily care and attention given to the mouth; and with this end in view the following plan is to be adopted, commencing September, 1915.

Twice a year during the Routine Inspection, following the midsummer and Easter vacations, a careful examination will be made of the condition of oral cleanliness of each child. A record will be made by the nurse upon the Class Record Card in the column provided.

Grading to be as follows:

Mouth condition excellent—Grade 1.

Mouth condition good—Grade 2.

Mouth condition fair—Grade 3.

Mouth condition poor—Grade 4.

In fixing the grade consideration to be given to the general health of the gums and cleanliness of the teeth and as to whether the child has a tooth brush and uses the same daily.

Upon the completion of the individual grading upon the Class Record Card the nurse will add the column and divide the total by the number of scholars in the room, thus arriving at the class grade. For instance, if the column totaled 104 and there were 40 scholars the class grade would be 2.6. The grade of each class in the school will then be entered upon the Dental Grade Form provided and in this way the oral hygiene grade of each school in the city will be obtained.

Dr. J. A. C. Hoggan, Appointed Dean

FRIENDS of Dr. J. A. C. Hoggan, formerly of Hamilton, and a graduate of the R. C. D. S. of Ontario, will be glad to learn that he was recently appointed Dean of the Dental College at Richmond, Virginia.

Dr. Hoggan went south two years ago to accept the chair of Orthodontia in the Richmond College, and is to be heartily congratulated upon his more recent advancement.

Undoubtedly Dr. Hoggan has the honor of being the youngest Dean, in point of years, of any Dental College upon this continent. We do not know whether Dean Hoggan should now be called "Jim," but nevertheless he will still be "Jim" to his many friends upon this side of the line who will follow his career with the greatest interest and the sincerest of good wishes.

Major A. A. Smith, Acting C.D.S., A.D.C.

MAJOR A. A. SMITH is acting Chief Dental Surgeon of the A. D. C. during the absence of Lieut.-Col. J. J. Alex. Armstrong. The latter accompanied the Army Dental Corps Overseas for the purpose of completing the organization of the dental service.

Recent Army Appointments

DR. E. A. GRANT has been appointed Captain to take charge of the dental service at Valcartier Camp and proceed overseas when the unit moves to the front. Dr. G. G. Hume was recently appointed for similar service at Niagara Camp. Dr. Fred T. Coghlan, Guelph, has left for London, Ontario, to take command of the 29th Battery, C. E. F.

International Dental Federation

THE next meeting of the International Dental Federation will be held September 2-3, 1915, at San Francisco, California.

Headquarters will be at the Cliff Hotel.

TRUMAN W. BROPHY,	BURTON LEE THORPE,
President.	Assistant Secretary,
3605 Lindell Blvd., St. Louis, Mo.	

“NEVER bear more than one kind of trouble at a time. Some people bear three—all they have now, all they ever had, and all they expect to have.”



Dr. A. E. Webster, Toronto
Dean, Royal College of Dental Surgeons of Ontario

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION" AS WELL AS THE "POUND OF CURE"

VOL. 5.

TORONTO, AUGUST, 1915

No. 8

The Operation of Tooth Extraction

BY T. W. WIDDOWSON, L.D.S., R.C.S., ENG.

IN the writer's opinion the success or failure attending the performance of the operation of tooth extraction will make or mar a reputation, and therefore a practice, to a much greater extent than will the success or failure attending any other operation in dental surgery.

The relief to the mind of a patient who has just undergone the successful gold filling of a tooth, or the satisfactory application of a bridge or denture, is incomparable to the relief occasioned by the successful completion of an operation of extraction; whilst, on the other hand, the distress of mind resulting from an unsuccessful attempt at extraction is much greater than results from the knowledge that a filling has failed or that a denture is uncomfortable.

A filling can be replaced, or a denture be re-made or made comfortable, and the incident closes and is often forgotten by the patient; but the fractured tooth or alveolus, the severe pain, the sloughing gum, in fact, all the details of the operation and its sequel are, in the majority of cases, forever present in the mind of the sufferer, acting as a nightmare to scare him away from all dentists and their surroundings as long as he lives.

Not only is the distress present in the patient's mind, but loss of nerve often accompanies it, with the knowledge that a second, third, or even further operation may be necessary before success is attained. This loss of nerve and of confidence by the patient is seen and felt by the

surgeon, who is, naturally, often adversely affected by such conditions.

The operation is one, therefore, which in student days should receive quite as much time, thought and attention as should any other operation in dental surgery.

Again, one should realize before it becomes too late that the years spent as a student in hospital are the years in which to obtain this knowledge to the full. Shakespeare has said:

“There is a tide in the affairs of men,
Which, taken at the flood, leads on to fortune;
Omitted, all the voyage of their life
Is bound in shallows and in miseries.”

These words are truly applicable in this connection.

I must say, from my experience of hospital practice, an experience which included a period as tutor and house dental surgeon to a large dental hospital, that I am convinced that the student does not devote his time sufficiently, nor pay the attention he should to the performance of the operation of extraction. There may be other reasons for laxity in this respect, but as the performance of this operation is rarely if ever asked for by the examiners for the L.D.S., Eng., I can quite understand that the man—and there are many such—who wishes to obtain his L.D.S., and thereby his L.S.D., with the minimum amount of work, leaves this portion of his practical surgery almost severely alone.

I consider it rather remarkable that men should be allowed to practice upon their fellows who have little, if any, real knowledge of the correct performance of the commonest and most painful of minor surgical operations, and a wrong to the public which lays it faith in him. A little more practical work in hospitals and a little less theory, *e.g.*, Comparative dental anatomy, would do a world of good.

Perhaps I am not a judge of human nature, but I hardly think that to a poor suffering mortal with a fractured molar and an exposed pulp a dissertation from his tormentor on the dentition of the duck-billed platypus, the mechanism of the poison fang of the viper, or the causes of the elasticity of the denture of the elephant's incisor, would be any compensation for his sufferings, or in any degree assuage his grief.

Nothing is more foolish than the lightly passing over of the study of systematic extraction, and men who have

qualified and placed their services at the disposal of a trusting public, and have been guilty of this laxity, will, I am convinced, look back with deep regret at the opportunities wasted and the chances thrown away.

Failures in operating are due more often than not to the ignorant application of force, the use of unsuitable instruments, the wrong handling of instruments, or the incorrect position of the patient or the surgeon.

The results of failure are not always immediately apparent, but the sequels are sometimes of rather a serious nature, *e.g.*, severe hemorrhage, necrosis, sloughing, prismus, severe pain, etc., etc.

For the operation one must know that there are several distinct methods and several distinct instruments; so that for one man to be a specialist in this direction he must give a separate study to the extraction of each tooth.

I have come across many men who were adepts at the extraction of lower molars or certain other teeth who were comparatively ignorant of the correct methods of operating upon the other teeth in the jaw.

Before proceeding to describe in a general way the different methods, I should like to mention a few factors which are necessary for their successful performance.

The possession of confidence is of great importance. So many failures are due to the want of it that its presence is absolutely necessary to success. Its absence is due only to want of knowledge and want of practice, and there is no possible way of possessing it other than by constant application of both the mind and the hand.

A nervous operator has rather a poor chance of success, especially if the patient is subjected to an anæsthetic such as N_2O , where the use of every available second is of importance and the wasting of time courts disaster. A superficial hold of the tooth is taken and the blades of the forceps are not allowed to pierce far enough between the adherent structures and the tooth, with the result that the crown is broken off; or, again, the gum and the alveolus may become involved and tearing, sloughing, fracture and necrosis result.

Therefore, as a student, the future dentist should practice, practice, and again practice, and in the majority of cases practice will bring confidence and nervousness be unthought of.

Another exceedingly important point to remember is that one's instruments should be sharp and suitable. Blunt forceps will not separate the adherent structures from the tooth, and their use may end in disaster. Suitable forceps

are also necessary for success. For instance, the roots of the upper incisors are almost conical, and for their removal the blades of the instrument should surround the greater portion of the circumference of the root to be removed.

You are all aware of the fact that when pressure is exerted upon a hollow cylinder at one or two points only it will give fairly easily, but when the pressure is brought to bear equally all round the difficulty of making any impression upon it is great.

This is exactly analagous to what happens in the case of the teeth, and the importance of the fit of the forceps is therefore obvious.

Another most important point to keep in mind is the position of the patient. To the latter is due to a great extent many of the failures which occur during the process of extraction.

In the removal of an upper tooth the patient's head should reach about as high as the breast of the operator, whilst for a lower it should reach the surgeon's hip. The position of the surgeon is also of importance. The writer who, of course, favors the use of English forceps, stands behind and a little to the right of his patient whilst extracting right lower cheek teeth, and in front and to the right of the patient in extracting any other tooth in the jaws.

Where possible the operator's left arm should support and steady the patient's head in the case of the upper teeth, whilst the left hand and fingers have several important duties to perform, viz.:

- (i) Supporting the mandible in operations on the lower jaw. When removing the right lower cheek teeth the fingers, with the exception of the first, should be placed under the chin, whilst when removing the left lower cheek teeth the thumb should be beneath the chin for support.
- (ii) Removing the tongue and cheeks from interference with the operation.
- (iii) Supporting the alveolus and directing the blades of the forceps.

The forceps should be held not too tightly, with the handles resting in the palm of the hand. The thumb should lie between the handles regulating and controlling the pressure. Now, the amount of force required to remove a tooth is not the sum of all the forces which retain it in the jaw. It is modified by and nearly directly proportionate to the direction in which the force is applied. In the first place,

therefore, the force should be applied in the direction in which there is the least resistance.

To do this one must have a thorough knowledge of both the anatomy of the fangs and the alveolus. All the teeth are broader externally than internally, and, with the exception of the alveolus in the region of the four third molars, the outer wall of the alveolus is thinner than the inner, so that in cases where the rotary movement is not correct the chief force exerted is directly outwards, except in the case of the four third molars, where the thinner inner alveolus renders it necessary for the main force to be directed inwards.

Again, the force should always be made where possible on the tooth itself, and not on surrounding structures, which are of a more delicate structure and more readily injured.

In the old days of the tooth-key this could not be carried out as the fulcrum bore upon the gums and alveolus, causing severe laceration and injury. For the removal of a tooth Tomes has laid down three important conditions:

- (i) The whole of the offending organ should be removed.
- (ii) Its removal should be effected with as little injury as possible to the structures in which it is implanted.
- (iii) The patient should be spared all unnecessary pain in the operation.

Such conditions are only reasonable, common sense and humane, and the operator who fails to carry them out thoroughly and conscientiously does so to his own disadvantage.

There are three distinct and separate actions in the operation of extraction of any tooth, viz.:

- (i) Grasping the tooth.
- (ii) Loosening the tooth from its connections.
- (iii) Withdrawing the tooth from its socket.

These three actions, although distinct and separate in themselves, are carried out in one continuous movement by an expert operator, whose aim is to give his patient the least possible pain or discomfort.

Should a tooth be broken down and the edges or an edge of the remaining portion be obscure, it is essential to first define the edges with a suitable probe before applying the blades of the forceps. By this means one is much more certain of obtaining a good hold of the offending organ and of successfully effecting its removal.

With respect to the first action, viz., grasping the tooth: This should be carried out deliberately and not too hurriedly.

So many men make the mistake of, one might say, flying at the tooth, with the idea that this is necessary in an expert operator, and very often come to grief in their hurry and excitement.

Now this action is in no way painful to the patient, and whilst one must remember that the other extreme can be reached, and that slowness must add to the dread, excitability and discomfort of the individual undergoing the operation, still there is no doubt that absence of unnecessary haste in this connection tends to ultimate success.

As a rule, it is best to first apply one blade of the forceps to the side most obscured from view, and finally the other blade.

The second action, viz., loosening the tooth from its connections, is a continuation of the last action, and is carried out by forcing the blades of the forceps between the root of the tooth and the alveolus. This, differing from the first action, should be carried out quickly. The blades of the forceps should on no account be allowed to stop at the neck of the tooth. For this to be successfully accomplished the use of sharp and suitably-shaped instruments is absolutely essential.

With all teeth except the molars the direct forcing of the blades of the forceps between the tooth and the alveolus should be combined with a slight rotary movement.

Having forced the blades of the forceps as far as is necessary, in all cases, except where the lower pre-molars are involved (when the rotary combined with an upward movement will be found sufficient for the tooth's removal), slightly force the tooth in the direction opposite to that in which the major force is to be applied and then apply the major force.

With the exception of the lower third molar, the minor force should always be inwards and the major outwards, because the outer plate of the alveolus is thinner in these positions. With the lower third molar the inner plate is the thinner, so that the minor force must first be applied outwards, and then the major inwards.

In all cases the major force, having once been applied, should be continued and not altered, except on very rare occasions, until the tooth is removed.

For the withdrawal of the tooth from its socket, with the upper teeth the major force should be combined with a downward, and with lower teeth with an upward force.

It is not my intention to describe in detail the extraction of each tooth. This you will find for yourselves in the text

books, but it would perhaps be advisable for me to mention briefly a few of the difficulties likely to be encountered in this operation and how best to overcome them.

The first upper pre-molar is, with the exception of a badly-impacted lower third molar, the most difficult tooth to extract properly and thoroughly, and it should always be borne in mind that, although it very often has one root only, it more often has two, the inner or palatine one being generally very slender and liable to fracture on too much force being applied.

This is one of those rare cases where it is prudent to re-apply the minor force after using the major, in order to sufficiently loosen the tooth from its connections to prevent fracture of one or both roots.

Broken-down lower pre-molars are also rather difficult of removal. This difficulty is, I think, in many cases accentuated by the operator who, instead of defining the edges and gradually separating the alveolus from the root by using a downward rotary force, simply attempts to push the blades of the forceps between these structures.

The use of the rotary force here is of great assistance.

The extraction of an upper molar having the buccal wall only standing, the other having been broken down or decayed below the gum margin, is not the easiest of operations. Here root forceps, preferably bayonets, should be employed; and let me impress upon my readers the maxim to *always use root forceps throughout the whole operation whenever they find a tooth that is liable to fracture*, and thus avoid the many accidents which would ensue if they did otherwise. With respect to the operation I have just mentioned, the inner blade of the bayonets should first be applied to the palatine root after it has been defined. The outer blade may then be applied to the stronger of the buccal roots. Then separate the adherent structures from the roots in the usual way. Having made sure that a firm hold of the tooth has been taken, force it inwards, rather more than usual, so that the inner beak of necessity slips up the palatine root and renders the hold still more firm. Then apply the outward force and the tooth may sometimes be withdrawn. Should any difficulty be experienced re-apply the inward force, when the tooth will probably be sufficiently loosened from its connections to enable it to be removed.

Sometimes, however, it will be necessary to use forceps, the inner blade of which being fairly wide, is applied to the palatine root and the outer blade narrow, being forced between the two buccal roots. The advantage of this pair

of forceps is that its blades can be made to penetrate between the roots and the alveolus much further than can those of an ordinary pair of molar forceps.

When there is very great resistance splitting forceps may be used.

The internal blade is applied to the palatine root and the external blade between the two buccal roots. An attempt can then be made at extraction, and this is sometimes successful, but if the resistance is too great even for this to be performed, sufficient pressure should be brought to bear upon the handles of the instrument to cut between the two buccal roots, after which it will be found quite simple to remove each root separately with root forceps.

Sometimes the upper third molar is almost hidden by the tissues of the cheek, due to the mouth being too widely open. A partial closure of the latter will enable the operator to remove the cheek from contact with the tooth with his fingers, and thereby allow him to obtain a good view of the whole offending organ. For the removal of this tooth the bayonet forceps are the most suitable.

Occasionally with upper first and second molars the buccal blade tends to slip round the buccal roots and refuses to be inserted between them. This is due to the posterior buccal root being more internal than the anterior. For the extraction of such a tooth the forceps with both blades similar to the palatine blade of an ordinary pair of upper molar forceps will be found very useful.

The removal of broken-down lower molars with one wall standing needs great care. A pair of forceps with one blade (the blade to be applied to the edge of the tooth on the lower level) longer than the other is useful in this case. The longer blade should always be applied first to the side of the tooth on the lower level.

Splitting forceps are sometimes useful for separating the roots where great difficulty is experienced.

Isolated teeth are also very difficult of removal, due to the density of the bone around them. If it is possible to postpone the operation, a good plan is to tightly tie a silk ligature around the neck of the tooth just below the gum margin and leave it for a day or two, when inflammation will have been set up, the tooth loosened and the operation rendered less difficult. Otherwise great care must be

exercised in the operation and too great force should not be used.

There is only one other point I shall touch upon, and that is the use of the elevator. With the exception of the extraction of lower third molars, which should nearly always be removed with the straight elevator, my maxim has been "*Never use elevators where forceps can be used.*" I have seen both used for similar operations, and in the hands of men equally expert, and in most cases the operations have been performed with less pain, less discomfort, less damage to the tissues, and with more satisfaction, both to the patient and the surgeon, by the use of forceps. Of course, there are cases suited only to the use of the elevator, e.g., where one root of a lower molar has been extracted and the other lies some distance below the gum. Here the use of the curved elevator down the socket of the extracted root is indicated.

Buffalo Letter

IN WHICH HABEC BREAKS OUT AGAIN.

IN our last disgorgement of language to ORAL HEALTH, we had our little say about some phases of present conditions relating to emetine, and now we wish to make a few remarks about tooth pastes and mouth washes containing ipecac that are being exploited by their manufacturers. Perhaps these remarks may be ill-timed, but our principal object is to give these manufacturers a tip that all dentists are not all fool all the time, even though appearances might in some instances point to such conclusion. We are patient, long-suffering and forgiving, but we do object to being branded as the original "sims."

For instance, the following quotation from the distributors of a new tooth paste: "The establishment of endameba bucallis as the cause of pyorrhea and the application of emetine as a curative agent has placed the treatment upon a sound basis. No one knows this better than the progressive dentist, for he has already given the treatment a trial and is enthused over the prompt and decided results obtained." Are these statements correct? Did any official body of dentists give this manufacturer such assurance or the right to use such misleading statements and send them broadcast throughout the land?

From another concern: "The revolutionary discovery of the specific cause of pyorrhea alveolaris, together with the treatment of the same by massaging the gums, put a new

light on the subject of prophylaxis. In addition to thorough cleansing, advantage is taken of the same operation to inject, by absorption, the active medium for the destruction and elimination of the causative factor." Can you make anything out of a line of talk like that? It is a most successful attempt at making a profound scientific statement without saying anything at all. Each manufacturer has the only efficient remedy, and the material advance in the price of their products is due (?) to the additional cost of the ipecac. One concern has added \$1.50 per dozen tubes of paste on this account. Do you think it warrants this difference? Our patients must pay seventy-five per cent. more for this reason. Of course, there can be no objection to doing so if the benefit is proportionally greater, but is it? There's the rub, and it is up to them to prove it. No one objects to paying if value is received, but until it is proven we have no right to subject our patients to added expense.

"Habec's" convoluted gray matter has for a long time been wrestling with the complex problem of the action of ipecac on the amœba, and after deep and silent meditation stretching over many moons he believes he has put across the great idea. Listen! also stop and look! Throw in the soft pedal; pull out the *vox humana* and let the sporadic essence of the wavelet mentalis float gently on the dying breeze of the setting—hem. Hush, and then a couple more hushes! Art thou ready, Ipecacus? Good. Ipecac, being by nature and disposition an emetic, makes the poor motherless little endamoeba sick in the tummy, and it throws up everything but its shoe-laces. The bi-product thus obtained effervesces and percolates through the contiguous contiguity and soon thereafter arrives at Peoria, near Chicago. When you come to think of it, the infinite number of awful diseases that human flesh (including bone and toe nails) is heir to, it really is appalling, and we can never cease to wonder that the Great Creator sees fit to let us stick around. Laying all joking aside, however, Emp. der Kaise at the present writing appears to have it all over the practitioners of every other school in the control of pyorrhea and everything else in the disease line. The Iron Cross is the diploma, and the cross of blood, misery and desolation is the insignia. Oh, God—how long! But, to "revert backwards," is there one among ye Romans—(This is Spart speaking. The profane of ancient Greece were wont to add acus, but such language is now obsolete.—Webster.)—who can disprove "Habec's" reasoning? If so, let him now begin! (Spart.) At any rate, is it not as near to the logical as a goodly percentage

of the stuff the vacuum cleaner extracts from many thin-shelled cocoanuts? Be that as it may, we don't care whether Bill Bryan signs this note or not, but even with the great Elbertus no more and Bill out of the White House tea party, we haven't been asked to be *Fra pro tem.* or to drink a grape juice cocktail.

HERE'S A NEAR JOKE.

The "little old Ford that rambles right along" has patiently stood the jubes and ridicule of the public for a long time, but has never yet failed to meet the demands of its owner and show its heels to the big high-priced touring car when it came to the supreme test.

Thus it is with many another article of public utility and necessity where faithful service should merit better treatment. The subject of our present discussion is the good old tooth brush, which has a record for unselfish service to its credit reaching afar back into the hazy annals of tooth-love. It has stood a glorious bulwark of defence to our national pride, to our moral development and to the fundamental principles of our higher civilization. Just pause for one fleeting moment and reflect upon the beautiful and inspiring sentiment oozing from the lines of that good old song:

"The old family tooth brush,
The moss-covered tooth brush;
The old family tooth brush,
That hung in the sink."

Ah! What hallowed memories of childhood's happy days do those rapturous words recall? But such thoughts are too sacred to be exposed to the profane and unappreciative populace. Even now we can see that long-suffering and patient old brush bristle up with importance and castile soap. Wot you not that Billy Sunday will ever play second fiddle to it as a saver?

Do you think that Emp. Bill would sport moustaches with that chronic aeroplane effect were it not for the much-maligned tooth brush? The situation is too horrible to contemplate. Also, it might seriously interfere with the innocent pastime of raising hogs, and how can us Germans live without pigs' knuckles and sauerkraut? Thus you will observe that the influence of the tooth brush is far-reaching, and the ramifications thereof might percolate through the woof and fibre of human welfare; yea, also, Barnacus, it might even loose the thread that fetters *Ne Plus Ultra* and

E Pluribus Unum so that together they might fall and no Bill Bryan there to raise them.

Therefore, as living examples of its benefits, let us rejoice that the sadly vilified, microbe-proliferating, bacteria-infested tooth brush is still on the job, and "Habec" hands you this little lemon-drop—that it's the sins of omission rather than the sins of commission that will leave the family tooth brush to grieve away its sad young life suspended over the kitchen sink.

And now for the olive in the Martini. Why are certain members of our august profession knocking this old friend of the human family? Is it because it has not kept our teeth from decaying? No, it is merely a sacrifice to the fussy notions of the purity crank. It is history repeating itself. Every so often we get a clean-up spasm and start a campaign against a lot of harmless little wigglers and imagine they are on everything and everywhere. In consequence the tooth brush stands accused of harboring myriads of them, and it must, therefore, be abandoned as a menace to public health. But before we go further, let us ask, "What would be the state of the public health without it?" Let the accusers give us something better before they rob us of the only means that admits us to respected society. Therefore, in the immortal language of the guy holding four aces, let them "put up or shut up!"

Harken ye, then, to the tobasco sayings of our own lamented Elbert Hubbard, from whose Waterman flowed streams of ink that traced wondrous thoughts that will continue to burn holes in the pages of the future for untold generations: "The widow who declined to marry the man, and who declared, with a fine Marie Corelli defiance, that it was because he was not chummy with a tooth brush, was right in her instincts. * * * The gentleman was not personally pleasant; and although he may have had college degrees, social position and dollars many, yet a breath that would stop a clock put him to the esoteric bad." And then The Spirit of the Roycroft asks himself these questions, which he answers in the style that made him famous: "Is love a matter of toothsome-ness? Is oratory a matter of toothsome-ness?" He convinces you beyond peradventure that the merry little tooth brush is an integral part of every human sentiment or activity. Again, we twitter, give us something better to take its place or fade away into the past tense of "Skiddoo."

We open the third and last chapter by introducing to our readers our old friend and stand-patter for every uplift,

Dr. Joseph Head, of Philadelphia. To his intimates he is plain Joe Head, and we are within due bounds when we say that he is "some Head" also, from his toes up to full six feet or better. With all of this goes a fine falsetto voice without a fal-sett-o teeth, proof of which will be duly presented.

And now, dear reader, work the primer on your imagination and behold Dr. Joe—(your pardon, Joseph)—upon the rostrum before several hundred medical men, brushing his teeth for their edification. It was no amateur bout, either. It began with a few feints and a light clinch, then a break-away, a side thrust, a jab to the centre, and then the mill was on in earnest. A swing to the right, a swing to the left, ducking, clinching, breaking, followed by rivet-machine punches, kept his audience spellbound at the marvelous demonstration. It was well worth the price of admission, the exact amount of which we refuse to disclose. But if it had cost anything to get in—well, never mind, no one asked for a rain check, anyway; however, a few on the front seats might have enjoyed the protection of an umbrella.

All this happened in Buffalo at the annual of the New York State Medical Association, and we are glad indeed that Dr. Head had the courage to present a subject of such apparent simplicity as that of the correct way to brush the teeth before such a gathering. It did them good, as did, also, the motion picture film with which he preceded his vigorous demonstration. The lesson to be gleaned, dear readers, is that the little things make up the big ones if you can get enough of them together.

Dr. Head recommends short bristles, and therefore cuts those of the ordinary brush off at least one-third. It makes your tooth brush look like a thousand-legged Daschound, and, like that cut little animal, has the advantage of being close to the base of operation. Try it and be convinced of its efficacy; and, as for cleanliness, it is the opinion of "Habec" that the man who cannot clean his tooth brush should hire a nurse-girl for life.

Just a little appendix, which should accompany all well-regulated outbreaks. You all know that Dr. Head is the original instigator of bi-fluoride of ammonium for the treatment of pyorrhea. Did it ever occur to you that it still has fourteen laps to the good over all other applications? You know how busy it gets when you fill a pyorrhea pocket with it, and that it starts a violent reaction. Do you thing little Amœba or any of her friends could survive it? Nay, nay, Pauline! As with the tooth brush, so with bi-fluoride of

ammonium: Prove that you have something better; then we're for it.

WE OWN HALF.

This is not a case of "too much Johnson"; in fact, it is quite the reverse. We would like more of him, yet we humbly acknowledge Canada's claim to the other half because he first saw the sun, moon and stars from that side of the river. So we graciously submit to fifty-fifty, but refuse to settle for less.

And so it came to pass that upon the evening of the fourteenth day of May, A.D. 1915, the New York State Dental Society presented Dr. C. N. Johnson with the Fellowship Medal for the current year. The honor conferred upon him acted like an old musket with a kick, for it came back upon the society with a good, hard recoil. It was handed to him on a record of merit such as few men can show, and it went *just* where it belongs. Of course, Bill Belcher and "Habec," having broad and chesty chests, still have one or two vacant spots where there is room for a medal about that size, but we are not jealous—just ambitious. Then, also, being so young, we feel that we can wait a few years longer.

We congratulate Dr. Johnson, and felicitate the New York State Dental Society.

THE KAISER SHOULD APOLOGIZE.

An example of the far-reaching effect of an overt act is illustrated by the loss of the *Lusitania*. A Buffalo dentist who was about to open a departmental dental establishment had engaged that master advertiser, Elbert Hubbard, to write for him "Little Journeys to a Great Dentist," whereby he anticipated great patronage as well as much gain. The great Fra was to have painted glowing and wondrous word pictures of how the victim would be started at the upper end of the line of hungry specialists and passed from one to the other to be properly sliced and trimmed, much as a beef is treated, from the starting point until it is finally resolved into the filling of a tin can. If there should be anything left, it goes to the dogs. Such were the wonderful opportunities awaiting the return of the Creator of the Roycroft; but alas! that great chief of all chieftains, His Niblets, the august Emp. William, put a double-fluted crimp in our confrere's ambitions just because he dearly loves to play submarine handball for his daily pastime. Surely it was very careless of the Emp., and we had just as soon tell him so.

Thus endeth the agony.

HABEC.

The Cummer Prosthetic Course for Practitioners



DR. W. E. CUMMER
and arrangement.

THE Cummer Post-graduate Prosthetic Course is to be held this year at the Royal College of Dental Surgeons from Monday, 16th August, to Saturday, 28th August, 1951. Dr. Cummer will be assisted by Dr. George H. Wilson, of Cleveland, Ohio, and Dr. Wallace Seccombe, of Toronto. The course will embrace a complete presentation of Removable Bridge Prosthetic Pieces, Modern Impression Making, Anatomical Articulation (Gysi system and others); Scientific Manipulation of Plaster and Vulcanite, including practical tests; Esthetics and Economics, including general considerations of successful office management, cost keeping, economic production and office system



CUMMER POST-GRADUATE CLASS, 1914.

The Cummer Course was so practical and so helpful last year that it was an inspiration to every man who attended.

There are so many new things in removable bridgework and prosthetic dentistry that no practitioner who has been out of college for a few years can afford to miss this course.

For full particulars and registration write Dr. W. E. Cummer, 2 Bloor St. East, Toronto.

Special Meeting of Faculty and Board R.C.D.S. of Ontario

AT a meeting of the Faculty of the R.C.D.S., held on the 13th July, 1915, Dr. A. D. A. Mason was elected Representative of the Faculty upon the Board of Directors of the R.C.D.S. The Board held a special meeting on Saturday, 17th July, 1915, when the following business was transacted:

CANADIAN ARMY DENTAL CORPS.

The President presented a letter from Major O. K. Gibson, of the C.A.D.C., suggesting that some small Certificate of Graduation from the R.C.D.S. should be given to each of those who have joined the C.A.D.C. It was decided that such a card be prepared for those graduates of the R.C.D.S. who are in Overseas Service, certifying them to be Graduates of the R.C.D.S., to be signed by the President and Secretary.

NEW APPOINTMENTS.

Dr. W. E. Cummer was asked to undertake the teaching of Physics, beginning with the Session of 1917-18, \$200.00 being appropriated during the coming Session for equipment, to be purchased by the Fittings Committee; also that Dr. Cummer be allowed the necessary hours, not to exceed fifty, for Demonstrations during the Session of 1915-16.

Dr. A. E. Webster was appointed Dean, Dr. W. E. Willmott Secretary of the Board, and Dr. Wallace Seecombe Professor of Preventive Dentistry. The latter to have charge, as Superintendent, of College Announcement, correspondence, and Registration of students.

The Dean was appointed College Representative upon the Senate of the University of Toronto.

LEAVE OF ABSENCE.

It was decided that Professors and Demonstrators who are in Overseas Service be granted leave of absence without salary.

RESOLUTIONS OF APPRECIATION—THE LATE
DEAN WILLMOTT.

Montreal Dental Club.

Communication was received from the Montreal Dental Club, as follows:

At a special meeting of the Montreal Dental Club, held last Wednesday, the following resolution was adopted:

Recognizing as we do, that for more than half a century Dr. James Branston Willmott has been the recognized representative head of the Dental Profession of the Dominion, in fact, as well as in name, the "Father of Dentistry in Canada," and realizing:

That not only as a teacher and Dean of a Faculty has he shown his great foresight and strength of character, but as a man and Christian citizen he has lived a life worthy of emulation; therefore,

Be it resolved, that we express to the Board of the Royal College of Dental Surgeons of Ontario, to the Faculty with which he so long a time was so closely identified; to the entire Dental Profession of Canada; and to the bereaved widow and son, our deepest sympathy in the loss which all have sustained in the death of our beloved confrere.

Very respectfully yours,

G. GUELPH ARMITAGE,

Hon. Sec.-Treasurer, Montreal Dental Club.

*Resolution Passed by Board of Directors, R.C.D.S., and
Faculty of School of Dentistry.*

That the Board of Directors and the Faculty Council of the Royal College of Dental Surgeons of Ontario desire to place on record their deep regret at the irretrievable loss they have sustained in the death of their beloved Secretary and Dean, James Branston Willmott, D.D.S., M.D.S., LL.D.

His strong personality and wonderful efficiency were the admiration of everyone associated with him in his work. It was owing to his remarkable courage and foresight that this college was first established, and it was he who gradually developed it into the foremost Dental College on this continent.

His experience, judgment and executive ability, coupled with a most retentive memory, made him invaluable to the Board of Directors. To the Faculty, of which he has for forty years been Dean, the loss will be no less keenly felt.

A sturdy Christian character and indefatigable worker,

full of sympathy and with an interest in every department, he was an inspiration to every member of the Faculty, no less than to every student. As our representative at meetings of Dental Teachers and other such bodies in the United States and elsewhere, he always maintained the dignity of the Canadian Dental Profession, and ever commanded respect for his Alma Mater.

The University of Toronto recognized his merit as a Dental Teacher and as a member of their Senate by conferring upon him the much-coveted degree of Doctor of Laws, a distinction not heretofore bestowed on any Dentist, and one which sheds lustre on this College and on the Dental Profession as a whole. Dr. Willmott was the first Canadian Dentist to have been elected an honorary member of the British Dental Association.

The Board of Directors and the Faculty wish to express to his family their heartfelt sympathy in the loss of a good husband and a fond father.

It must be, we conceive, no little comfort to them in their grief to reflect that his long and useful life was, to the very last, devoted to the advancement of his chosen profession and the betterment of his fellow-citizens.

Drs. Abbott, Trotter and Davy were appointed a committee to consider a suitable memorial to the memory of the late Dr. Willmott.

The Canadian Army Dental Fund

A MOST gratifying response has been received from the Dental Profession to the appeal of the C.A.D.F. Committee for subscriptions to this fund. The following amounts have been received by the Treasurer, Dr. C. V. Snelgrove, 105 Carlton Street, Toronto, up to the time of going to press:

CONTRIBUTIONS TO THE ARMY DENTAL FUND.

A. R. Leggo, Toronto.....	\$ 2 50	C. F. Knight, Toronto.....	5 00
J. E. Rhind, Toronto.....	10 00	A. W. Forbes, Toronto.....	5 00
C. R. Minns, Toronto.....	10 00	J. S. Chambers, Toronto...	10 00
D. R. Callum, Toronto.....	10 00	O. A. Winter, Toronto.....	5 00
R. G. McLaughlin, Toronto..	10 00	F. C. Husband, Toronto....	10 00
J. F. Ross, Toronto.....	25 00	T. W. Wylie, Toronto.....	10 00
F. S. Woollatt, Toronto....	5 00	S. L. Frawley, Toronto.....	10 00
C. V. Snelgrove, Toronto...	25 00	Bernice Johnson, Toronto..	10 00
T. E. Ball, Harriston.....	5 00	H. A. Holmes, Toronto.....	10 00
H. E. Eaton, Toronto.....	5 00	E. C. Boyle, Toronto.....	5 00
E. L. Gausby, Toronto.....	10 00	S. B. Gray, Toronto.....	10 00
C. E. Sutton, Toronto.....	10 00	H. W. Reid Torono.....	5 00
Sydney W. Bradley, Toronto.	5 00	J. A. Bothwell, Toronto....	25 00
W. Cecil Trotter, Toronto..	25 00	P. J. Watson, Toronto.....	5 00

Arthur Day, Toronto.....	10 00	E. H. Robinson, Toronto...	5 00
N. S. Coyne, Toronto.....	5 00	S. F. Boyle, Toronto.....	3 00
A. H. Mabee, Gananoque...	10 00	M. Kates, Toronto.....	5 00
Arthur N McGill, Elmira...	2 00	M. Schwartz, Toronto.....	5 00
L. F. Riggs, Toronto.....	10 00	M. Pivnick, Toronto.....	5 00
W. M. McGuire, Simcoe...	10 00	R. M. Burgess, Toronto....	5 00
A. A. McKenty, Peterboro...	5 00	S. T. Floyd, Toronto.....	5 00
A. E. Webster, Toronto....	25 00	T. J. Jones, Victoria, B.C..	10 00
T. S. Tucker, Toronto.....	2 00	Hugh Cunningham, Toronto.	10 00
W. H. Coon, Toronto.....	10 00	W. J. Hill, Alliston.....	2 00
T. N. McGill, Toronto.....	20 00	Arnold Semple, Toronto....	5 00
C. A. Kennedy (in trust		W. B. T. Amy, Toronto....	25 00
Army Dental Corps Fund)	259 84	D. W. Duffin, Toronto.....	10 00
A. J. Brown, Michell.....	5 00	C. R. O'Brien, Toronto....	10 00
W. C. Macartney, Ottawa...	10 00	T. H. Graham, Torono....	10 00
K. M. McVey, Toronto.....	10 00	W. F. Roper, Toronto.....	5 00
A. J. Broughton, Toronto...	10 00	H. E. M. Richardson, To-	
Irving Ante, Toronto.....	5 00	ronto	5 00
W. A. Black, Toronto.....	15 00	G. C. McKinley, Toronto..	5 00
J. H. Duff, Toronto.....	5 00	C. O. Fallis, Toronto.....	10 00
F. L. Frank, Shelbourne...	5 00	F. N. Regan, Toronto.....	10 00
L. L. Follick, St. Mary's..	10 00	W. A. Scott, Toronto.....	10 00
A. E. Santo, London.....	20 00	A. Rose, Toronto.....	5 00
C. H. Waldron, Toronto....	10 00	Geo. G. Jordan, Toronto...	20 00
W. E. Cummer Toronto....	25 00	M. S. Vair, Toronto.....	5 00
R. G. McLean, Toronto....	25 00	D. H. Beaton, Toronto....	10 00
A. J. McDonagh, Toronto.	50 00	C. P. Sherman, Toronto....	5 00
W. J. LaFlamme, Torono..	10 00	A. MacKenzie, Toronto....	5 00
H. W. Anderson, Toronto..	5 00	J. A. Lockheed, Hamilton..	5 00
B. F. Nicholl, Toronto.....	10 00	O. W. Canning, Toronto...	5 00
C. E. Brooks, Toronto.....	10 00	R. A. Dunlop, Toronto....	15 00
T. W. Dawson, Toronto.....	10 00	Wallace Seccombe, Toronto.	25 00
G. W. Grieve, Toronto.....	25 00	C. H. Tanner, Victoria, BC.	5 00

DONATIONS TO CANADIAN ARMY DENTAL CORPS SENT TO
LIEUT.-COLONEL J. A. ARMSTRONG, OTTAWA.

Eastern Ontario Dental Association.....	\$50 00
Capital Brewing Co., per Harry Kuntz.....	25 00
P. D. Ross (The Journal).....	10 00
Mrs. G. I. Dewar.....	10 00
Mrs. Dr. Milton Armstrong (proceeds of reception).....	157 60
Mrs. John Bingham.....	20 00
Mrs. John Robertson.....	5 00
Dr. G. P. Mathewman.....	5 00
Dr. H. J. Peebman.....	5 00
Mrs. H. Jackson.....	5 00
Dr. Oliver Martin.....	5 00
Alex. Thompson, Esq.....	5 00
Little Tots of Elgin Street School.....	67

Mrs. Ermatinger, St. Thomas, Ont.....	20	doz. towels
	3	operating coats
The 2 Mac's, Ottawa.....	10	doz. towels
Miss C. Doyle and Miss T. N. Enmon, Marine Dept., Ottawa	3	doz. towels
Mrs. J. A. Armstrong, Ottawa.....	1½	doz. towels
Mrs. S. C. Davidson, Ottawa.....	5½	doz. towels
Mrs. F. M. Barton, Ottawa.....	1½	doz. towels
Mrs. C. Clark (St. Matthew's Church).....	5¾	doz. towels
Mrs. R. J. Cameron, Ottawa.....	5	doz. towels

Total 55¼ dozens

The profession will be greatly interested in the following letter received by the Secretary of the Committee from Captain Edmund A. Grant, in charge of Dental Services, Valcartier:

(Copy)

Valcartier Camp, July 13, 1915.

Dr. A. E. Webster, 3 College St., Toronto,

Secretary Canadian Army Dental Fund.

Sir,—I should have written you before this, but owing to delay in the arrival of our equipment we are just commencing active operations to-day, and therefore have not had much opportunity to let you know, as you requested me to do, our requirements in the way of Dental accessories, and, in fact, can hardly do so yet. However, we would much appreciate a supply of towels, gauze wipes, and a couple of laundry bags.

Our only means of obtaining general supplies is from Ordnance Stores, and their range is very limited. Am trying to get authority to order these as required.

Could write you after we have been in operation for a week or so; or, better still, Dr. Amy is coming here next week, and on his return could let you know what we are in need of.

We have secured a fine, large building, with running water, electric light, phone, etc., which will do splendidly for our work. Have assisting me Lieut. W. A. Sangster and Lieut. D. H. Hammell, a graduate of last year. One of last year's Sophomore class, Sergt. H. B. Legate, is also here as Dental Assistant. The other assistants are Sergt. Frank Martin and Sergt. H. Mercer.

I report directly to the A.A.G., as the head of this department. While waiting for equipment we spend our time complying with all the military forms: Drawing uniforms, equipment and stores from the Ordnance. Made arrangements with paymaster, etc., and our organization is now fairly complete, and we can devote all our time to the real work.

There are about 5,000 troops in camp now, with new arrivals all the time, and as there are two French-Canadian regiments we will have lots of work to do. Would greatly appreciate the assistance of any dentists who wish to volunteer their services for a few weeks. If you know of any who would come, would be obliged if you would ask them to communicate with me. Transportation and subsistence would be provided. I think it would make an interesting holiday, and we would do our best to make it enjoyable.

I am sure the other Army Dental Surgeons appreciate as much as myself the work of the Army Dental Fund Committee. It seems to me that you are doing the real hard work and we are having the fun. On their behalf, as well as my own, would like to thank you for your efforts.

Sincerely yours,

EDMUND A. GRANT, *Capt.*,
C.A.D.C.

LIST OF OFFICERS OF THE CANADIAN ARMY DENTAL CORPS
APPOINTED TO MOBILIZATION CAMPS.

RANK.	NAME.	CAMP.	DATE OF APT.
Lieutenant	Shaw, F. P.....	London Camp....	29/5/15
Lieutenant	Hume, G. G.....	Niagara Camp...	25/5/15
Lieutenant	Trelford, W. G...	Niagara Camp...	16/6/15
Captain	Winnett, A. W...	Barriefield Camp.	21/6/15
Hon. Capt.....	Simpson, S. H...	Barriefield Camp.	21/6/15
Captain	Grant, E. A.....	Valecartier Camp.	5/7/15
Lieutenant	Hammell, D. H..	Valecartier Camp.	5/7/15
Lieutenant	Sangster, W. A..	Valecartier Camp.	5/7/15
Lieutenant	Morrison, J. P...	Sewell Camp	27/5/15
Lieutenant	Stratton, D. P...	Sewell Camp	27/5/15
Lieutenant	Tait, E. S.....	Vernon Camp ...	29/5/15
Captain	Wright, J. E....	Calgary Camp...	21/6/15
Lieutenant	Cashman, A. V..	Calgary Camp...	26/5/15
Hon. Lieut.	Doore, J. C.....	Sussex Camp.....	1/8/15
None yet		Aldershot Camp..	

The several committees organized throughout the Dominion feel confident that the \$10,000 objective will be reached in due course. It is to be sincerely hoped that the individual members of the profession will make the work of the committee as light as possible by a prompt and generous response.

Asepsis and Modern Dentistry

M. J. PAYNE, D.D.S.

THE mouth is an excellent culture tube, presenting ideal surroundings for the growth and development of bacteria. The conditions present in practically every mouth are: remains of foodstuff, both proteid and carbohydrates, sugar, lime salts, organic matter, a proper temperature, and moisture; absolutely the entire favorable conditions for bacterial growth. Therefore, your work is confined to that portion of the body admitted to always harbor bacteria and presenting all essential and favorable

*Read before the Shenandoah Valley Dental Association, Staunton, Va., May 5th, 1915.

conditions favoring bacterial growth and development.

The practice of dentistry and dental surgery is, therefore, confronted at all times with conditions ideal for the development of septic manifestations, and, I may say, that few if any mouths of to-day present normal conditions.

It is, therefore, not amiss to discuss with you the relation of asepsis to the practice of dentistry.

Although the mouth is inhabited with many forms of bacteria, and although the mouth furnishes ideal conditions for the rapid development and multiplication of bacteria, yet wounds of the mouth and in the mouth heal with great rapidity, and usually very satisfactorily, even though flagrant neglect of ordinary cleanliness is observed. Many dental and surgical procedures in the mouth attended by the most careless neglect of asepsis are unattended by bad results. This is true in case the mucous membrane only is involved, but a vastly different story is observed if the injury or operation invades the deeper structures, the periodontal structure, the periosteum, the bone, or the soft tissues beneath the jaw, or the root canal.

In extractions of teeth the ample drainage of the wound safeguards the patient to a large extent, and, as you know, an extraction of an upper tooth is far freer of septic reaction than the lower teeth.

That the abundant supply of blood and the open-drained wound, combined with the lively efforts of the patient in almost constantly mechanically cleansing the wound by suction through the aid of the buccal muscles, unconsciously, so to speak, removes the septic matter from the wound in the mouth, and thereby aids the healing through drainage of the discharge by spitting.

The apparent infrequency of septic phenomena in the mouth following dental procedures must not be used as an argument for the neglect of aseptic precautions. The influence of septic condition of the mouth is just now receiving the attention it deserves, and which has been so long and so sadly neglected, to the detriment of the body constitution.

The early recognition of dental decay, the recognition, cure and care of pyorrhœa (Riggs' disease), the fact that this disease is no longer held to be caused by uric acid, to be a condition resulting from constitutional disease, but due to bacteria (organism of pus-producing function), and often with associated organism, *i.e.*, a mixed infection, the amœba, the pus coccus, and the pneumococcus, *B. coli*. This discovery is already yielding excellent results, beneficial alike to the mouth condition and the general body condition.

The recognition that pyorrhœa, dead teeth, septic matter in the root canal, a dead nerve lying in the nerve canal, blind abscesses, all play an important part in the causative condition of general diseases (as pneumonia, gastric diseases, intestinal complaints, rheumatism or joint infections, arthritis of the deforming type of arthritis), and that peridental inflammation is a distinct and potent cause of nervous manifestations of obscure origin, is a sufficient warranty of the importance of the subject to demand the most careful attention on the part of the dental surgeon and the physician, the diagnostician.

Likewise, the most certain relation of arterio sclerosis and arterial degeneration to slow-acting but constant mouth infection, and the probable relation of appendicitis to oral infection, and also the almost conclusive proof that all cases of Bright's disease, here broadly so grouped, may be traced to an infection, and a large per cent. of such infection probably originate from septic conditions of the mouth. (By exclusion).

Such evidence impresses medical men with the importance of oral surgery, the necessity for preventive measures in dental practice, and the application of the principles of asepsis in relation to the mouth condition; whether found in health, or in pathological conditions, arising from or due to septic condition of the mouth.

The need of recognition of pathological conditions of the mouth is now plainly apparent to the medical profession; the careful physician or surgeon is constantly advising or sending cases for dental work, to correct septic conditions of the mouth. If a pyorrhœa cannot be cured it is far better to sacrifice every tooth in the head than to have a slowly-acting septic infection affecting the general body, giving rise to a renal infection or Bright's disease or a joint infection. I have advised that the teeth be extracted, and am sure that I have obtained distinct improvement in certain cases of Bright's disease with associated septic condition of the mouth, and benefit has followed in those cases. Specialists and the better class of physicians and surgeons refer all cases of septic conditions of the mouth to competent dental practitioners for any oral treatment. It is, therefore, the duty of the dental profession to be prepared to correctly treat all such conditions in accordance with the present demands of asptic practice.

Inasmuch as a rule the dental practitioner is first to observe and make the diagnosis, or aids the physician in making the diagnosis, either by having first observed the

case, owing to the fact that the public now seek a dentist when the mouth presents an abnormality, before consulting a physician, it is, and becomes the imperative duty of the dental profession, to be in accord with the importance of this subject, its prevalence, correct diagnosis and treatment. Just here I want to say that I regard the school inspection of the mouths of children to be equally as important a part of the school inspection as that for adenoids, etc. The teeth are vastly more apt to be diseased and are, in my opinion, of greater importance.

It is likewise of first importance that the dental profession proclaim the importance of septic condition of the mouth. What man would permit his child or wife, or himself, to carry a suppurating sore or abscess for many days without consulting a physician; yet day after day, month after month, a vastly more dangerous condition in the mouth is neglected. It is true, to our shame, that the medical and dental profession *both*, at times, neglect to advise the correction of such conditions, either through carelessness, or I am better persuaded to believe, through some ignorance on both our parts, to the detriment of our patients—who deserve better treatment. I cannot too strongly impress upon you the importance of this subject and the importance of the correction of septic oral condition in its relation to preventive medicine. That is in the prevention of constitutional diseases, such as Bright's, arterial diseases, septic infection of the joints and digestive disturbance and septic conditions of the intestinal tract by the cure or, yet better, by the prevention of septic oral conditions.

It is well nigh criminal to neglect the treatment of the septic mouth when an abundant opportunity is daily presented. It is not only proper, but imperative, to begin the preventive treatment in early life, and to educate the public in the importance of the subject. The application of an aseptic practice and the careful conduct of all manipulation in the mouth under the most careful aseptic surroundings and practice is to be strictly enjoined, and enforced. The dental practitioner should be as careful of his asepsis as the abdominal surgeon.

I counsel you to try, for a period, the most careful attention to asepsis and notice the improved condition of your patients. It will bring success in your work. I counsel you not to reinfect, or to infect your patient by instruments used in any mouth, passingly or carelessly sterilized, or not sterilized. It is certain that many cases of infected mouth

conditions may be traced to the use of instruments and hands not previously made aseptic. Discard the reliance upon useless, inefficient proprietary antiseptic remedies. Salt water and mechanical cleansing of the mouth is far better. Scrub the teeth with several freshly sterilized brushes, and follow by the pressure sprays, before beginning any work. Prepare your hands with care before doing any work in the mouth. Do not rely on instruments called sterilizers that have to have the name worked in bold letters on their face and are made to avoid the necessity for boiling your instruments. Boil every instrument before it is used in the mouth. Avoid the contact of the hand with any instrument the surface of which will later come into contact with the part to be treated.

Surround the area to be treated by dams, and at least apply alcohol to the tooth to be treated before you begin and after the cavity is prepared.

Apply the aseptic practice of cutting away, not only all diseased tissue, but such as will later become infected, and thereby get rid of tissue easily giving way to infective processes. Go to the bottom of pus pockets, drain out this infection thoroughly, and disinfect.

In filling root canal use a previously sterile filler, and don't infect it by letting it come into contact with the hands. Use absolute alcohol in the canal just before the root filling is applied, and see if there is not markedly less tenderness than when the alcohol is omitted. The reason is plain. You obtain a dry canal, which is one of the most essential and necessary aseptic principles, that is the absence of moisture. The dry treatment of wounds is far better than the old moist treatment. Moisture favors, while dry conditions or a lack of moisture absolutely inhibits the growth or development of bacteria.

It is impossible to obtain a perfectly aseptic mouth—an ideal condition of the mouth—yet this is not an argument to neglect aseptic practice in the treatment and management of mouth condition. For in surgical practice the advent of asepsis has been attended with results hardly dreamed of by the most sanguine and enthusiastic operators.

I commend to you the aseptic practice, rather than a reliance on inefficient antiseptic remedies, and am sure that an adherence to the rigid details of asepsis is of no more or greater importance to the surgeon than to the careful dental practitioner. Asepsis has yielded brilliant results in surgery. Its complete victory may be attained in oral surgery, and thereby bring to mankind the richest of blessings.

Dental Work in the Public and Parochial Schools of the City of Detroit

THE free dental work for children in the City of Detroit is conducted by the Board of Health. Notwithstanding this fact there exists friendly co-operation between the civic dental officers and members of the school teaching staff, largely through the personal interest of some of the members and officials of the Board of Education. One cannot but feel that should a lack of harmony ever occur between the above mentioned bodies the efficiency of Detroit's school work would be largely impaired.

The school teacher sends the child to the dental clinic. Though home conditions are not personally investigated the teacher, through daily contact with the child, soon learns which children are entitled to free dental service and which should be sent to the family dentist. Indeed the teacher is relied upon not only to send pupils to the dental clinic, but also to see, in so far as is possible, that the mouth of each child is kept in a condition of health through home care and attention. This co-operation between the dentist and teacher is one of the best features of the dental work in Detroit.

Last year there was an appropriation of \$20,000 for dental work. The organization next year will comprise a Chief Dental Officer, five Dental Inspectors and twelve Dental Clinics—each clinic is in charge of a Dental Officer, who is given a Lady Assistant. The Assistant is taught

- (a) to assist operator at chair.
- (b) to take charge of the reception and dismissal of patients.
- (c) make all records.
- (d) clean and sterilize instruments, etc.
- (e) take charge of dental supplies.

The clinics with a Dental Officer in charge of each are situated as follows:

Four in Hospitals.

[The Editor recently spent a most interesting and profitable visit with Dr. Bion R. East, Chief Dental Officer Board of Health, Detroit. The Detroit system of school dentistry is different in many ways from that adopted by most other cities. There are both strong and weak features in every system, and a brief outline of the Detroit system is here published, in the hope that it may be of real help and interest to those who are endeavoring to further public health and efficiency through the dental care of the boys and girls of our schools.]

Three in School Buildings.
Four in Settlement Houses.
One central clinic in Board of Health Building.

DENTAL INSPECTORS.

Each inspector presides over a district of the city and inspects all the children of his district twice a year. Inspections include the public, parochial, and German-Lutheran Schools.

A notification card is taken home by those requiring dental services. This card contains printed instructions in oral hygiene and an invitation to those entitled to free service, to visit any one of the twelve dental clinics. (This plan, however, makes it difficult to control the clinics as sometimes 40 or 50 children will present themselves at the same hour.)

The teacher keeps the class dental record and gives credit to each child as their dental work is completed.

At the conclusion of each morning's work the dental inspector assembles, in one room, all of the classes examined that morning, and by means of lantern talks and demonstrations instructs the scholars in the importance and proper care of the teeth.

ADDITIONAL HELP FROM TEACHER.

An honor roll is drawn upon the blackboard in colored chalk, and as each child returns from Dentist or Free Clinic with a certificate of perfect oral condition, the child's name is entered on the Roll of Honor.

Monthly report to parents contains columns headed "Oral Hygiene" and "Personal Hygiene." The letters U and S are used indicating that the conditions in each case are either Satisfactory or Unsatisfactory.

Money was obtained through public subscription. Ten thousand packages containing a tooth brush, a carton of tooth powder, and a bag of candy were distributed among the children. The candy was included to encourage the good will of the children toward the dental operator and to secure co-operation.

*Modern Methods of Producing Local Anesthesia**

BY HERMAN PRINZ, M.D., D.D.S., PHILADELPHIA, PA.
HISTORY.

THE elimination of pain during surgical operations is inseparably interwoven with the history of the human race. It has always been the aim of those interested in the cure of bodily ills to relieve pain in some empirical manner. The efforts to solve the riddle of painless operations were, however, seemingly so very futile that even as late as 1832 Velpeau was led to express his pessimism as follows: "To escape pain in surgical operations is a chimaera, which we are not permitted to look for in our time." Little did he suspect that he stood at the very threshold of the discovery of anesthesia and that less than a decade later the "nirvana" of painless operations would be an accomplished fact. And when Dieffenbach, in 1847, wrote these classical words regarding the use of ether as an anesthetic, "the beautiful dream, to eliminate pain, has become a fact—pain, the highest consciousness of our earthly existence, its clearest conception of the imperfections of our body, it has to bow low before the powers of the human mind," the world at large awakened to the fact that pain had been conquered.

The discovery of anesthesia is essentially to be credited to the dental and medical profession of the United States, and the names of Crawford W. Long, Horace Wells, William P. G. Morton and Charles F. Jackson are inseparably connected with it. "If America has contributed nothing more to the stock of human happiness than anesthetics, the world would owe her an everlasting debt of gratitude," said the late Samuel D. Gross, the eminent surgeon, who had ample opportunity to observe in his own operating room the most remarkable changes that followed the introduction of anesthetics.

From an historical viewpoint, comparatively few important methods for the purpose of locally obtunding pain are to be recorded prior to the introduction of cocaine. The impression of nerve trunks for the abolition of pain seems to be of an old and unknown origin, which was re-

*Read before the Michigan State Dental Association, 1915.

vived by Guy du Chauliac and Ambroise Pare, and finally found a permanent place in surgery as the Esmarch elastic bandage. Physically reducing the temperature of a part of the body by the application of cold was instituted much later. Bartholin and Severino introduced this method in the middle of the sixteenth century. It became a lost art, however, until John Hunter, of London, again called attention to its benefits by demonstrating it upon animals, and Larray, the chief surgeon of Napoleon's army, employed it for amputating purposes (1807). James Arnott, in 1849, utilized a freezing mixture, consisting of ice and salt, as a means of producing local anesthesia.

Through the efforts of Sir B. W. Richardson, in 1866, it was placed on a rational basis by the introduction of the ether spray. The various narcotics which were employed for internal purposes were also made use of as local applications. Mandragora, henbane, aconite, the juice of the poppy head, and many other analgesic drugs enjoyed a world-wide reputation. There is probably no other medicinal plant around which clusters more mysterious and quaint associations than mandragora. It should be remembered, however, that mandrake, or mandragora (*atropa mandragora*), must not be confounded with American mandrafe, or May apple (*podophyllum peltatum*), to which it bears no relation.

The empirical search for new methods and means pressed the mysticism of the electric current into service, opening a prolific field to the charlatan, which even to this day has not lost its charm. Richardson's voltaic narcotism for a time attracted the attention of the medical and dental profession. Its inventor claimed "that by the action of a galvanic current, passing through a narcotic solution, held in contact with the part to be operated upon, some of the narcotic substance passed much more rapidly into the tissue, and that in many instances complete local anesthesia was in this way produced by solutions which are entirely inert when applied, even to the most delicate tissue, without the galvanic current." This very same principle, discovered by Reuss in 1807, and introduced by him as "electric endosmosis," or as "cataphoresis," by E. du Bois-Raymond, was "newly discovered" and reintroduced into dentistry about a decade ago. In cyclonic fashion it swept over the globe, but to-day it is almost forgotten.

Electric or galvanic anesthesia was suggested as far back as 1851 by Dr. A. Hill, of Connecticut. Francis, in 1858, recommended the attachment of the electric current to the

well-insulated handles of the forceps for the painless extraction of the teeth, and, as dental depots still offer appliances of this nature for sale, it seems that this method is still in vogue with some operators. According to Regner and Didsbury, as cited by Sauvez, a current of electricity of high frequency, when directed toward the long axis of a tooth for a shorter or longer period previous to its extraction produces insensibility to pain. In 1880 Bonwill suggested his method of "rapid breathing as a pain obtunder," which he claimed "produces a similar effect to that of ether, chloroform and nitrous oxid gas in their primary stages."

In the early days of modern dentistry many feeble efforts were made to alleviate pain during trying operations. Chloroform, alcohol, ether, aconite, opium, the essential oils, and many other drugs were the usual means that were employed, either separately or as compounds, usually under fanciful names, for such purposes. Snape's calorific fluid, composed of chloroform, tincture of lemon balm, and oil of cloves; nabolis, consisting of a glycerid of tannic acid and a small quantity of chloral hydrate; Morton's letheon, which was sulphuric ether mixed with aromatic oils, are examples of proprietary preparations which enjoyed quite a reputation in their time. In 1853 Alexander Wood introduced a method of general medication by means of hypodermic injections, and a few years later the French surgeon Pravaz modified the old style syringe for this special purpose, which since is known as the "Pravaz" or hypodermic syringe. At once it was suggested to apply such drugs as morphine or tincture of opium for the purpose of producing local anesthesia. The results were not encouraging, however, until cocain was advocated. Cocain was discovered by Niemann in 1859, but it required twenty-five years to make known the remarkable anesthetic properties which this alkaloid possessed when applied in the ready soluble form of its hydrochloric salt. It was on September 15, 1884, that Carl Koller, of Vienna, presented this epoch-making communication at the Ophthalmologic Congress at Heidelberg, in which he demonstrated the effects of cocain as a local anesthetic. With the introduction of this drug into therapeutics, local anesthesia achieved results which were beyond expectations, and its final adoption created a new era in local anesthesia.

MEANS OF PRODUCING LOCAL ANESTHESIA.

The term anesthesia (without sensation), which was suggested in 1846 by the great physician-literateur, Oliver Wendell Holmes, to Doctor Morton, is usually defined as an

artificial deprivation of all sense of sensation, while the mere absence of pain is referred to as analgesia. Correctly speaking, the term local anesthesia is partially a misnomer. In producing local anesthesia we do not fully comply with all the requirements that anesthesia demands, because a part of the sensorium—the sense of touch, for instance—is not abolished. The term local anesthesia, has, however, acquired such universal recognition that it would seem unwise to recommend a change.

Anesthesia may be artificially produced by inhibiting the sensory nerve fibers at their central end-organs in the brain or at their peripheral end-organs in the tissues, thus producing general and local anesthesia. Local anesthesia may be obtained in two definite ways. We may inhibit the function of the peripheral nerves in a circumscribed area of tissue, and we refer to this process as “terminal anesthesia,” while, if we block the conductivity of a sensory nerve trunk somewhere between the brain and the periphery, we speak of it as “conductive anesthesia.” Conductive anesthesia may be produced by injecting into the nerve trunk proper—endoneural injection—or by injecting into the tissues surrounding a nerve trunk—perineurial injection. The latter form is the usual method pursued when conductive anesthesia for dental purposes is indicated. Specific forms of local anesthesia may also be produced by paralyzing the sensory ganglia in the brain or in the spinal cord; these methods have, however, no bearing on the subject under consideration.

The successful practice of local anesthesia involves the carefully adjusted co-operation of a number of important details, each one constituting a definite factor in itself, which, when neglected, must necessarily result in failure. As a whole, the practice of local anesthesia by the hypodermic method represents the composite of the following factors:

1. A solution of active ingredients corresponding to the physical and physiologic laws which govern certain functions of the living cell.
2. A carefully selected hypodermic armamentarium.
3. A complete mastery of the technic.
4. A proper selection of the correct method suitable for the case in hand.
5. Good judgment of prevailing conditions.

PHYSIOLOGIC ACTION OF ANESTHETICS.

According to more recent therapeutic conceptions, it is generally recognized that a drug or combination of drugs which simultaneously produce local anemia and inhibition of the sensory nerves in a circumscribed area of tissue is the logical solution of the question of local anesthesia. Certain important factors, however, relative to the physiologic and physical action of the solution employed for hypodermic injection upon the cell govern the successful application of such methods. It is of prime importance, therefore, to comply with the laws regulating the absorption of injection solutions—osmotic pressure.

If we separate two solutions of salt of different concentration by a permeable animal membrane, a continuous current of salt and water results, which ceases only after equalization of the density of the two liquids—that is, equal osmotic pressure (according to the Boyle-Van Hoff law) is established. The current passes in both directions, drawing salt from the stronger to the weaker solution, and water vice versa, until osmotic equilibrium is obtained. The resultant solutions are termed, according to De Vries, isotonic.

Osmotic pressure is a physical phenomenon possessed by water and all aqueous solutions, and is dependent on the number of molecules of salt present in the solution and on their power of dissociation. In organized nature these osmotic interchanges play an important role in regulating the tissue fluids of both animals and plants. In the animal tissue the circulation depends principally upon the mechanical force exerted by the heart. The life of the cell depends on the continuous passage of these fluids, which furnish the nutrient materials, consisting of water, salt and albumen. These chemicals are normally present in certain definite proportions. The membrane of the living cell is, however, only semi-permeable—that is, the cell readily absorbs distilled water when surrounded by it. The cell becomes macerated, loses its normal structure, and finally dies. If on the other hand, the surrounding fluid be a highly concentrated salt solution, the solution absorbs water from the cell; no salt molecules enter into the cell body proper. The cell shrinks, and finally dies. This process of cell death is in general pathology referred to as necrobiosis.

Another important factor teaches that all aqueous solutions that are isotonic possess the same freezing point—that is, all solutions possessing an equal freezing point are

equi-molecular, and possess equal osmotic pressure. This law of physical chemistry has materially simplified the preparation of such solutions. The freezing point of human blood, lymph, serum, etc., has been found to equal approximately 0.55 degrees C., which in turn corresponds to a 0.9 per cent. sodium chloride solution. Such a solution is termed a physiologic salt solution. In the older works on physiology a 0.6 per cent. sodium chloride solution is referred to as a physiologic salt solution, and corresponds to the density of the blood of the frog. A slight deviation above and below the normal percentage of the solid constituents is permissible. When physiologic salt solution at body temperature is injected into the loose connective tissues under the skin in moderate quantities, neither swelling nor shrinking of the cell occurs. A simple wheal is formed, which soon disappears, and as no irritation results, consequently no appreciable pain is felt. Other similar bodies that are equally soluble in water act in the same manner, with the exception of the salts of the alkali and alkaline earth metals—as potassium or sodium bromid. The latter substances produce intense physical irritation, followed, however, by prolonged anesthesia, and in consequence are termed by Liebreich painful anesthetics.

If, on the other hand, simple distilled water is injected, only a superficial anesthesia is produced; the injection itself is very painful, and acts as a direct protoplasm poison by maceration of the cell contents, which results in the death of the cell. If distilled water approximately at a ratio of ten drams to the pound of body weight is injected into dogs, they will succumb in a short time. The injection of higher concentrated salt solutions produces opposite effects; water is removed from the tissues with more or less pronounced pain, and followed by superficial anesthesia. The red blood corpuscles are extremely susceptible to any injected fluid which is not isotonic in its nature. They are universally destroyed (hemolysis) by the injection of fluids which are not represented by an isotonic salt solution. Severe tissue disturbances result, which may terminate in gangrene.

Hypotonic solutions—solutions containing less than 0.9 per cent. of sodium chlorid—cause swelling of the tissue, while hypertonic solutions—solutions containing more than .09 per cent. of sodium chlorid—produce shrinkage. These manifestations are proportionately the more intense the further the solution is removed from the freezing point of the blood. Furthermore, hypotonic as well as hypertonic solutions require much more time for their absorption than

isotonic solutions, as the osmotic pressure has to be standardized to the surrounding fluids—that is, to the isotonic index of the tissue fluids. Local anemia, or ischemia—a temporary constriction of circulation—prevents, as it has been experimentally shown, the rapid absorption of fluids that are injected into the affected area. Retarded absorption of the injected fluid, holding poisonous drugs in solution, means increased action of these poisonous drugs within the injected area. Increased action denotes increased consumption of the poisonous drugs, and, as a consequence, there is less danger from general absorption. The more important means applied for the purpose of producing local anemia are:

1. The Esmarch elastic bandage.
2. The application of cold.
3. The extract of the suprarenal capsule, or its synthetic substitutes.

Some observers have maintained that local anemia produces anesthesia. This is not, however, the case, as it is merely an important means to confine the injected anesthetic to the anemic region, and thus bring about an increased and prolonged action of the drug. Consequently the concentration of the anesthetic solution may be of a lower percentage, which, of course, lessens the danger of intoxication. For plausible reasons the Esmarch elastic bandage cannot be made use of for dental operations.

Physically reducing the temperature of the body by the application of cold (ice pack, ice and salt mixture, cold metals, etc.) was practiced by the older surgeons. James Arnott, in 1848, suggested the adoption of diminished temperature as “a safer mode than any hitherto in use of producing insensibility in surgical operations,” and Blundell, in 1855, advocated ice packs and salt solutions as means of producing “local anesthesia by congelation” for dental purposes. Through the efforts of Sir B. W. Richardson, in 1866, this method was placed on a rational basis by the introduction of his ether spray. To obtain good results, a pure ether (boiling point 95° C.), free from water, is necessary. Certain other hydrocarbons possess similar properties in varying degrees, depending on their individual boiling point.

In 1867 Rotenstein called attention to the use of ethyl chlorid as a refrigerating agent, and Rhein, in 1889, introduced methyl chlorid for the same purpose. In 1891 Redard reintroduced ethyl chlorid as a local anesthetic, which since has become known by many trade names as antidolorine,

kelene, narcotile, etc.—and mixtures of the first two in various proportions, known as anestol, anestile, coryl, methethyl, etc., are extensively used in minor oral and general surgery. A pure ethyl chlorid (boiling point 55 F., 13 C.) is best suited for this purpose, as it lowers the temperature of the tissues sufficiently to produce a short superficial anesthesia in a few minutes. Too rapid cooling or prolonged freezing by methylchloride (boiling point 12 F., 24 C.), or the various mixtures thereof, produce deeper anesthesia, but such procedures are dangerous. They frequently cut off circulation in the affected parts so completely as to produce sloughing (necrosis). Liquid nitrous oxid gas, liquid or solid carbonic acid (recently known as carbonic acid snow), and liquid air, all of which have a boiling point far below zero, are recommended for similar purposes, but they require cumbersome apparatus and are extremely dangerous.

ETHYL CHLORID AND ITS ADMINISTRATION.

Ethyl chlorid—Monochlorethane; hydrochloric ether, C_2H_5Cl . “A haloid derivative, prepared by the action of hydrochloric acid, an absolute alcohol.” At normal temperature, ethyl chlorid is a gas, and under a pressure of two atmospheres it condenses to a colorless, mobile, very volatile liquid, having a characteristic, rather agreeable, odor and burning taste. It boils at about 55 F. (13 C.) and is very inflammable, burning with a smoky, green-edged flame. It is stored in sealed glass or metal tubes, and when liberated at ordinary room temperature 70 F., (21 C.) it evaporates at once. In commerce it is supplied in plain or graduated glass tubes of from 3 to 60 grams capacity, or stored in metallic cylinders holding from 60 to 100 grams or more. To remove the ethyl chlorid from the hermetically sealed smaller tubes, the neck has to be broken off, while the larger glass and metallic tubes are provided with suitable stopper corks of various designs to allow definite amounts of the liquid to be released.

MODE OF APPLICATION.

For the extraction of teeth, immediate removal of the pulp, opening of abscesses, and other minor operations about the oral cavity, the tube should be warmed to body temperature, by placing it in heated water, and its capillary end should be held about six to ten inches from the field of operations. The distance depends on the size of the orifice of the nozzle, and complete vaporization should always be produced. The Gebauer tube is fitted with a spray nozzle,

which shortens the distance to one or two inches, and is especially well adapted for dental purposes. The stream is directed upon the tissues until the latter are covered with ice crystals and have turned white. For the extraction of teeth the liquid should be projected directly upon the surface of the gum as near the apex of the root as possible, but care should be taken to protect the crown of the tooth on account of the painful action of cold on this part. Tissues to be anesthetized should first be dried and well surrounded by a film of vaseline or glycerine, and protected by cotton rolls and napkins, to prevent the liquid from running into the throat. Let the patient breathe through the nose. Occasionally light forms of general anesthesia are induced by inhaling vapor. On account of the difficulty of directing the stream of ethyl chlorid upon the tissues in the posterior part of the mouth, it is not successfully applied in those regions. The intense pain produced by the extreme cold prohibits its use in pulpitis and acute pericementitis. To anesthetize the second and third branch of the fifth nerve, it is recommended to direct the stream of ethyl chlorid upon the cheek in front of the tragus of the ear, but the author has not seen good results from such a procedure. Caution should be exercised in using ethyl chlorid near an open flame or in conjunction with the thermocautery, as severe burns have resulted by setting the inflammable vapor on fire.

Within the last decade the active principle of the suprarenal capsule has evoked extensive comments in therapeutic literature. It has been isolated by a number of investigators under different names, as epinephrin by Abel (1897), suprarenin by Feurth (1898), and adrenalin by Takamine and Aldrich (1901). Many other titles are given to this chemical—as adnephtrin, adrin, paranephtrin, suprarenalin, supracapsulin, hemostasin, etc. The United States Pharmacopoeia (eighth revision) has not as yet admitted this alkaloid to its pages, and, therefore, whenever we refer here to the hydrochloric salt of the alkaloid of the suprarenal capsule, we speak of it as adrenalin, the term which is at present preferred in the United States. Adrenalin is a grayish-white powder, slightly alkaline in reaction, and perfectly stable in dry form. It is sparingly soluble in cold and more soluble in hot water, is insoluble in ether or alcohol, and with acids it readily forms soluble salts. The preparation that is employed mostly for therapeutic purposes is a solution of adrenalin hydrochloride in a 1 to 1,000 physiologic salt solution, to which preservatives—as small quantities of chloretone, thymol, etc.—are added. Adrenalin

solution does not keep well. On exposure to air and especially in the presence of even minute quantities of an alkali it is easily oxidized, becoming pink, then red, and finally brown, and with this change of color its physiologic property is destroyed. If the adrenalin solution be further diluted, it becomes practically worthless within a few days.

When adrenalin is injected into the tissues, even in extremely small doses, it temporarily raises the arterial blood pressure, acting as a powerful vasoconstrictor by stimulating the smooth muscular coat of the blood vessels, and thus produces local anemia. Large doses finally reduce the blood pressure, and heart failure results. The respiration at first quickly increases, but slows down and finally stops with expiration. Its action is largely confined to the smooth muscle fibres of the peripheral vessels. Adrenalin is destroyed by the living tissue cells, the body ridding itself of the poison in some unknown manner. While adrenalin does not possess local anesthetic action, it increases very markedly the effect of certain anesthetics when combined with them. Very recently, it has been shown by Esch, that adrenalin possesses a specific action on nerve tissue, viz., it prepares the latter tissue in a peculiar way so as to take up the anesthetic more readily. Esch compares this action with the use of a mordant in the dyeing industry, viz., to "fix" the color. These observations are of vast importance, in connection with the production of local anesthesia. Carpenter, Peters, Moller, and others referred to the use of adrenalin in this respect, and finally Braun, in 1902, published his classic researches, and to him and his co-workers, especially Heinze and Lawen, belong the credit of establishing a rational basis for the production of local anesthesia. It is claimed that secondary hemorrhage frequently occurs after the anemia produced by the adrenalin has subsided, and that tissues themselves suffer from the poisoning effect of the drugs, resulting in necrosis. Such results are produced only by the injection of too large quantities of the drug, which by their deeper action close up the blood vessels, and, if the tissues are too long deprived of the circulation, we are able to understand why sloughing may result. Small doses of adrenalin have no effect upon the tissues or on the healing of a wound. Palpitation of the heart and muscular tremor, which were occasionally noticed in the early period of the use of the drug, are the direct result of too large doses.

Recently a synthetic adrenalin has been successfully prepared by Stolz, which, with hydrochloric acid, forms a stable

and readily soluble salt. It is known as synthetic suprarenin hydrochloride. The new chemical has been carefully tested physiologically and in clinical work, and the general consensus of opinion points to the fact that it is not alone equal, but in certain respects superior, to the organo-preparations. Synthetic suprarenin solutions may be readily sterilized by boiling. They are relatively stable, and their chemic purity insures uniform results. They are comparatively free from dangerous side actions. The writer's observations regarding the value of synthetic suprarenin relative to its actions and its general behavior is in full accordance with the above statements, and its advantages over the organo-preparations has led us to adapt it as a component in the preparation of local anesthetic solutions. For dental purposes—that is, for injecting into the gum tissue—the dose may be limited to one drop of the adrenalin solution (1 to 1,000) or the synthetic suprarenin solution (1 to 1,000), added to each cubic centimeter of the anesthetic solution, five drops being approximately the maximum to be injected at one time.

Ever since the introduction of cocain into materia medica for the purpose of producing local anesthesia, quite a number of substitutes have been placed before the profession, for which superiority in one respect or another is claimed over the original cocain. The more prominent members of this group are tropacocaine, the eucaines, acoin, nirvanin, alypin, stovaine, novocain, and very recently, quinin and urea hydrochlorid. None of these compounds, with the exception of novocain, has proved satisfactory for the purpose in view. The classical researches of Braun have established certain factors which are imperative to the value of a local anesthetic. These factors concern their relationship to the tissues in regard to their toxicity, irritation, solubility and penetration, and to the toleration of adrenalin.

There is no need at this moment to enter into a discussion of the pharmacologic action of the drugs usually classified as local anesthetics. Let it suffice to state how the above mentioned drugs fulfil the demands of Braun. Tropacocain is less poisonous, but also less active than cocain, it completely destroys the action of adrenalin; the eucaines partially destroy the adrenalin action, they are, comparatively speaking, equally as poisonous as cocain; acoin is irritating to the tissues and more poisonous than cocain; nirvanin possesses little anesthetic value; alypin and stovaine are closely related, producing severe pain when injected, which occasionally has resulted in necrosis. Quinin

and urea hydrochlorid reacts strongly acid and, as a consequence, severely damages the tissues in the injection area. As we have recently shown elsewhere it possesses no advantage when employed as a local anesthetic in dental operations but has many disadvantages as compared to cocain or novocain.

Novocain alone fully corresponds to every one of the above claims. Its toxicity is about two to six times less than cocain; it does not irritate in the slightest degree when injected, consequently no pain is felt from its injection *per se*; it is soluble in its own weight of water; it will combine with adrenalin in any proportion without interfering with the physiological action of the latter, and it will be readily absorbed by the mucous membrane. The studies of Biberfeld and Braun brought to light another extremely interesting factor concerning the novocain-adrenalin combination. Both experimenters, working independently of each other, observed that the adrenalin anemia on the one hand, and the novocain anesthesia on the other hand were markedly increased in their total effects upon the tissues. Consequently, a small quantity of this most happy combination is required to produce the same therapeutic effect as a large dose of each individual drug alone would produce when injected separately. The injection of a solution of the combined drugs is precisely confined to the injected area, general effects are therefore rarely produced.

Novocain is the hydrochloric salt of a synthetically prepared alkaloid, the methyl ester of p-amidobenzoic acid. It is a white crystalline powder, or colorless needle-shaped crystals, melting at 263 F., (156 C.). It may be heated to 200 F., (120 C.) without decomposition. It dissolves in an equal amount of cold water, the solution having a neutral character; in cold alcohol it dissolves in the proportion of 1 to 30. Caustic alkalies and alkaline carbonates precipitate the free base from the aqueous solution in the form of a colorless oil, which soon solidifies. It is incompatible with the alkalies and alkaline carbonates, with picric acid, and the iodides. Its solutions may be sterilized by boiling without decomposition.

(Continued in next issue)

MULTUM IN PARVO

ROOT-CANAL FILLINGS.—The only perfect root-canal filling is one that fills all of the canal to the apex with some material that is impervious to moisture, be it metal, gutta percha, cement, or anything else. Antiseptics cannot be relied on for any definite period.

AFTER ABSTRACTING.—Abscessed teeth, especially in the lower jaw, always syringe the sockets with hot water and an antiseptic.

CARBOLIC ACID BURNS.—Alcohol followed by glycerin is an antidote for carbolic acid burns, giving immediate relief when this agent accidentally gets where it is not wanted. Common vinegar is also efficient in like cases.

PLACING CHLOROPERCHA IN ROOT CANALS.—Thoroughly clean, disinfect and dry the canal, then inject a few drops of wood creosote, or carry it up with a fine broach. Then inject a little chloroform to displace the creosote; then insert a suitable gutta percha point wet with the solution of chloropercha and force it to the end of the root by tapping the plugger gently.—*D. J. A. Libbey, in August Summary.*

GREEN STAIN.—Though “green stain” can be removed from teeth by means of a paste of powdered pumice and tincture of iodine, it is not so well known that a paste made of pumice and peroxide is equally efficacious.

A MOUTH WASH.—The following is a useful formula: Acid Benzoic, grs. xvij; Tinc. Eucalpti, ziss; S.V.R., ziss; Ol. Cinnam. (vel. of menth. pip.), miiij. Add a teaspoonful to half a glass of water.—*Dental Record.*

IN THE USE OF POLISHING STRIPS.—A small piece of physicians’ cloth (cheese cloth) over the ends of the fingers which hold the strip against the filling in polishing prevents the strip from making those painful little cuts in the fingers.—*C. G. Scott, Toronto.*

PROTECTING GUM FROM ARSENIC DRESSING.—In a deep but narrow cavity where it is difficult to put arsenic and be sure that the gum is safe, fill three parts with gutta percha packing against the next tooth for support. Remove with

excavator, or warm plugger, sufficient of the temporary stopping to get the devitalizer in the required position, and fill up with more gutta percha.—*New Zealand Dental Journal*.

THE QUESTION OF EXTRACTION.—In the insertion of an upper denture, the question of extraction of certain teeth simply is resolved into this solution: The time has come when the patient must wear a plate, and what shall be done to make the denture the most comfortable and useful? If the extraction of certain teeth is needed, extract, explaining to the patient the reason.—*L. P. Haskell*.

MELTING ALUMINUM.—In melting aluminum previous to casting new, clean ingots should always be used. The metal should never be overheated, and when fusing it should be slightly agitated with the end of an ordinary slate pencil from time to time and all dross removed until a smooth, clean surface presents, after which the casting should be made, observing only moderate speed in doing so, as the metal remains liquid for some moments.—*H. J. Goslee, Dental Review*.

ALUMINUM BASE-PLATES.—The following are the reasons why swaged aluminum base-plates are more susceptible to disintegration than cast base-plates: The purest and least contaminated aluminum to be had is not attacked by the oral secretions. Chemical action can only attack the metal through impurities embodied in it. Aluminum in ingot form, it is reasonable to suppose, is uncontaminated, or the least contaminated. Aluminum rolled plate may, and undoubtedly does, become contaminated. It is rolled in iron; it is swaged between base metal dies while saturated with oil, and impurities are practically driven into the surface of the metal, there to be attacked and eaten out.—*R. C. Brophy, Dental Review*.

CEMENT FOR MENDING PLASTER CASTS.—The following makes a reliable cement for mending broken plaster casts: Dissolve celluloid in acetone to a syrupy consistency. Smear the fractured surfaces and press together for a minute or two. It dries quickly and holds securely. Patches may be put in celluloid auto windows by moistening the surfaces with acetone and pressing together, leaving them transparent as before.—*W. Buzzel, D.D.S., Dental Summary*.

ORAL HEALTH

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A Monthly Journal devoted to the furtherance of individual and community health by the advancement of Dental Science and Oral Hygiene.

Published in the hope that it may reach those with an open mind, a willing heart and a ready hand to serve.

SUBSCRIPTION PRICE - \$1.00 PER YEAR.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, 229 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to the Publishers, Oral Health, 269 College St. Toronto, Canada.

Vol. 5

TORONTO, AUGUST, 1915

No. 8

EDITORIAL

Don't Clean Teeth

NO dentist should describe the operation of prophylaxis as that of "cleaning teeth." It is true that upon the completion of prophylaxis the teeth and mouth are "clean," but the work entails the skilful removal of plaques and calcareous deposits and, in addition, the exact polishing without injury of all the surfaces of the teeth. The operation certainly is not properly described as the cleaning of teeth, and the use of such nomenclature only depreciates what should be regarded as the most important operation in the practice of modern and preventive dentistry.

Patients should be taught to properly clean their own teeth, and to perform that service as frequently as may be necessary. After the mouth and teeth are, *from the patient's standpoint*, perfectly clean, prophylaxis may be more or less imperatively required. This fact should be impressed upon patients that they may value prophylactic service and appreciate the amount of time and skill demanded for this particular work.

The absurdity and unfairness of a fixed fee for a given operation is well illustrated in prophylactic treatment. The fee should be commensurate with the time, energy and skill expended, and is no small factor in impressing the patient with the importance of the service rendered.

Securing the patient's co-operation in the daily care of the mouth and the inauguration of an office system for the encouragement of the periodical return of the patient for examination and treatment, are also most important considerations in preventive work.

Official Recognition of Oral Hygiene and Dental Inspection

AS illustrating the interest taken in Oral Hygiene by school authorities, the following extract from a letter addressed to the Toronto Public School Principals by R. H. Cowley, Chief Inspector, Board of Education, Toronto, is of interest:

“To anticipate and arrest disease and to promote sound health in every pupil, the Board of Education is spending larger sums of money each succeeding year on medical and dental inspection.

“The co-operation of principals and their staffs has contributed to the good results thus far obtained. Hearty and persistent co-operation in every school will ultimately lead to the possible elimination from school life of disease, and the conditions and habits that induce disease.

“While the regulations prevent the medical officers and nurses from teaching in the classes, the school staff may render indispensable aid by using wisely the short lesson periods for hygiene regularly prescribed for all grades throughout the school year.

“In this connection the importance of oral hygiene can hardly be given too much emphasis. The work accomplished in the school dental clinics is of great value, but prevention of dental disease can be secured only by inculcating among the pupils the habit of properly and regularly cleansing the mouth and teeth.

“Where members of the staff of any school desire instruction in respect to oral hygiene and the proper method of brushing the teeth, the Chief Medical Officer, on communication from the principal, will be glad to arrange for the same.”

Obituary

ANNOUNCEMENT of the death of Dr. A. W. Spaulding at Opal, Alberta, on May 22nd, 1915, will be received with regret by the members of the Ontario dental profession who knew him.

He was a pioneer resident of Parkdale several years before that village became a part of Toronto, being an active worker in the Parkdale Methodist Church.

Graduating in dentistry from the R.C.D.S., in 1878, after a student period with the late Dr. W. Case Adams, he took his D.D.S. degree in 1890. From 1885 to 1889 he was identified with the R.C.D.S. as demonstrator of operative and prosthetic dentistry.

Practising dentistry in Toronto for twenty-six years affected his health, for which he sought improvement by engaging in farming in Alberta about 1904.

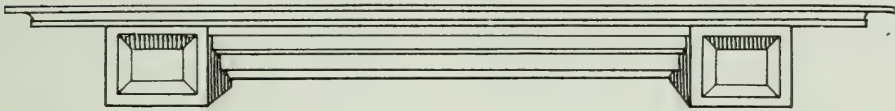
He was born in Darlington, Durham County, Ont., in 1848, and died at sixty-six years of age. He left a wife and family of four—Mrs. Jas. Chapman, Edmonton; Mrs. E. H. Owen, Toronto; Russell Spaulding, Opal, Alta., and W. G. L. Spaulding, D.D.S., Toronto.

Royal College of Dental Surgeons Lectureship Vacant

Applications will be received by the undersigned up to September 1st, 1915, for the position of Lecturer in Dental Jurisprudence. Vacant by the recent death of the late Dr. J. B. Willmott.

W. E. WILLMOTT, Secretary, R. C. D. S. of Ont.
96 College St., Toronto.

THE necessity for the proper care of the mouth in prevention and cure of disease being fully recognized, the fee for dental advice is not questioned any more than the consultation fee of physician or surgeon.





Capt. George Gow

Capt. F. R. Mallory

*Dental Surgeons with the University of Toronto Base Hospital.
Canadian Army Dental Corps.*

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 5

TORONTO, SEPTEMBER, 1915

No. 9

The Tooth Brush Does it Help or Hinder Oral Cleanliness

MUCH discussion has resulted from an article by Dr. B. Feldman, which appeared in *Oral Hygiene*, upon the subject of the tooth brush. *The Literary Digest* asks, under the heading "The Tooth Brush Indicted":

"Must we unlearn all that our diligent parents and teachers once did their best to instil? If there ever was an implement generally acknowledged as indispensable to civilization, it was surely the tooth brush. It has been to most of us almost a religious symbol of that personal cleanliness which the old Law places next to Godliness. And now, forsooth, we are told that it is not conformable to modern hygiene and sanitation! Its sins are both of omission and commission. It fails to remove impurities, and it serves as an efficient instrument to inoculate the teeth and gums with disease. Thus it has served as an instrument, not of personal hygiene, but of infection."

The following extract from the article in question will serve to indicate the position taken by Dr. Feldman:

"Not only has the public become accustomed to look upon the brush as necessary, but our teachers and the great army of dentists are recommending its diligent use. This teaching of school children and of adults how to use the brush properly constitutes what I consider 'the menace of the tooth brush'; because it has been proved to me that the brush is defeating the very purposes of our oral hygiene

movement and that we are actually infecting the mouth instead of cleaning it by the use of the filthy, germ-ridden thing. Dr. Head called the attention of the profession to the dirty condition of the brush as it is used by the general public. Professor Miller proved that the brushing action of the bristles upon the surfaces of the teeth had a very injurious mechanical wasting effect near the necks of the teeth. Professor Hutchinson reported the conclusions which were reached in this matter by research workers, and his remarks are so emphatic that the matter can not be well ignored. The plain truth is that the brush is a dangerous instrument which is practically impossible to sterilize. It can not be boiled with impunity, and practically all agents, such as tricresol or formalin, render the bristles of the brush or the handle unfit for further use. To quote Professor Hutchinson: 'Not only the public, but the dentists themselves, have little conception of the filthy state of the comparatively clean tooth brush as used in every-day life.'

"But granting the impossible—*i.e.*, that the brush with its bristles covered with a thin ribbon of tooth paste or powder is sterile—why should we use it when it does not reach the interproximal spaces where it is most important that the bristles should reach? Tooth decay starts in these spaces in the majority of cases. An efficient cleaning is probably never obtained by the brush. What is more probable is that many of the germs that are present on the bristles are deposited in these spaces. The silk floss does reach between the teeth and does clean out the food debris. It seems self-evident that the brush fails to do what it is supposed to do, so why use it when it does not do any good?

"To cite an example which was given to me by a friend a few minutes before I gave an oral hygiene talk to school children: the big brush that is used by the street cleaners will clean the surfaces of the cobblestones in the gutter, but will glide over the cracks where most of the dirt is settled. This seems to me to be a splendid word-picture; and its worthy object was to illustrate how and why to use the tooth brush to dislodge the food debris 'between the cracks.'

"But why should we follow the example or pattern the cleaning of teeth after the crude method of the cleaning of gutters having cobblestones? To cite other examples: a stiff brush with a liberal amount of soap and water, vigorously applied, will clean the smooth surfaces of floors; the cloth of a person's suit can be cleaned by the clothes brush

and one's shoes can be polished by a shoe brush. Inert substances can not cry out that this rubbing *hurts*. Dr. W. D. Miller proved that the same kind of agent, a brush of smaller size but exactly the same in principle, *does hurt* the soft tissues of the oral cavity. This tearing and rubbing on the gums of the teeth are done by a brush which is filthy with those very germs that we are so very anxious to rid the mouth of. Would the surgeon sanction the cleansing of an open wound with an infected brush which was covered with an antiseptic tooth paste or powder? Are we oral surgeons, therefore, justified in teaching children and adults to use such an instrument on soft gums and teeth? Experiments were made which proved that the brush contains a quantity of germs comparable with the number of germs found in sewage. Twelve sterile brushes were used in these experiments, applied once on the teeth, rinsed ten times in a tumbler of water, were left to stand for twelve hours, when all the bristles were removed with sterile forceps and the organisms counted in the usual way. In eight cases out of twelve the results were as quoted. One hates to think how filthy the brushes are that are used daily, especially by those people in whose mouths septic processes are taking place. No one that can look squarely at facts and that has the courage to stand by a proved principle can continue to use the brush nor advise its use for his clientele. . . .

“Our research workers, of which we have far too few, have proved conclusively, to me, at least, that the tooth brush is undesirable and inefficient. It has been shown that pastes and powders and lotions are beneficial, whenever they do not discolor the teeth. Of what good is research work if the rank and file do not benefit by the findings? The conclusion which I have reached is that an able and unbiased board or commission of dentists should solve this problem for the dental profession, and give us a technique for cleaning the oral cavity that is *real oral hygiene*. This could then be taken up by the rank and file, and the doctrine spread broadcast. Until such a method is adopted, may I suggest that we go back to the old Japanese method of using the clean forefinger to massage and clean the gums and outer surfaces of the teeth? It seems to be Nature's own instrument that ‘just fits the bill.’ Instead of using salt and water as did the Japanese, we can use our modern lotions, to be followed by the recognized efficient silk-floss or strips. Mind you, this is my own idea; but I cite it only to create a discussion among dentists to obtain *real oral*

prophylaxis. But let us start right by abandoning the filthy tooth brush once for all."

The Washington Times refers to Dr. Feldman's article as "The Tooth Brush's Peril," and comments in a recent issue as follows:

"These scientific gentlemen stop at nothing. They do not hesitate to take sure aim at the things we take most for granted. Long ago we grew used to their attacks upon religion, homes, and other recognized institutions, but even at that it is something of a shock to have one of them take a fling at the very bulwark of our civilization—the tooth brush.

"Even the small boy has regarded the implement as a sad but necessary evil. Yesterday found thousands of children marching to New York's public schools with brushes neatly wrapped in sterilized paper, much as the child of former years went to Sunday School displaying a Bible earned by a year's unremitting attendance. Irksome as the tooth brush is no one has had the temerity to attack it, hitherto, even when grown up. Many adults remembered other indignities of early days, and there are some who aver that spanking should be abolished, and many mourn because that reform was introduced too late to help much.

This scientist's knowledge of human nature is faulty. What if the crevices of the molars are not reached by the bristles, which he pictures teeming with living and pernicious microbes? Would he rob the great majority of persons of that mental satisfaction that comes from the regular use of the prophylactic implement? Would he deprive them of that glow of satisfaction, that feeling of innate superiority, that subtle class distinction that arises from the assiduous practice of this simple ceremony?

The tooth brush will die hard. After carrying it into heathen lands like a veritable mace of progress, after waving it at the submerged tenth as the mystic sign of uplift, after flaunting it before school children as the magic key to sanitation and hygiene, it will not so easily be lost on the say-so of any literal, plodding scientist."

An Alabama daily states that it is not impressed with Dr. Feldman's "denunciation of the tooth brush," and proceeds:

"Not only the dictates of common sense, but the views of the best known dental surgeons in the country stand in opposition to the 'findings' of Dr. Feldman.

"If the street sweeper's brush will glide over the cracks in the cobblestone, cleaning only the surface, why go to the great pains and expense incident upon sweeping the streets of our cities? Why not abandon this plan of cleaning and use wet blankets to mop up the dirt and filth?

"Dentists admit that a perfect apparatus for cleaning the teeth has not yet been devised; the ideal tooth brush is yet to be found; but any tooth brush is better than none, and most tooth brushes get excellent results when used systematically and intelligently."

The *Cincinnati Post* treats the matter editorially, in a humorous vein, under the caption "The Lair of the Germ":

"Ah! what's the use in combing your hair, swatting the fly, sleeping on a roof, and lambasting the baby for eating mud pies? These germologists never agree on anything for five days, anyhow!

"The tooth brush, says Dr. Feldman, is full of germs and cannot be cleared of germs by any ordinary process. On every bristle of the tooth brush there are 74,198 germs, which, in two weeks or thereabouts, will produce, by geometrical progression, 798,000,000,084 more germs. These latter, in turn, as the tooth brush ages, will produce progeny to the number of—well, we just haven't type enough to show you that number. Call it penty enough to scare the daylights out of you.

Moreover, according to Dr. Feldman, the tooth brush wears away your teeth and hurts your gums, and folks should go back to the old Japanese method of cleaning their teeth with the forefinger, rather than risk the common tooth brush.

"However, cleaning teeth with a forefinger, like a Jap, or with a big toe, like a hen, won't appeal to many. We'll stick to the tooth brush until the germ sharps get up some sort of a buzzer that we can take to the washstand and buzz the germs galley west with it."

The serious side of the question from the standpoint of the advancement of the oral hygiene movement is illustrated by the comment of the *Denver News*. After referring to the recent "Tooth brush Week," when the children of the New York public schools received instruction in the proper care of the teeth and were given practical demonstrations in the use of the tooth brush, this paper says:

"A more serious question is raised by Dr. Bernard Feldman. The doctor indicts the tooth brush as a peril rather

than a means of conserving the teeth. There are three counts in his indictment. First, it fails to reach the crevices of the teeth where organic matter lodges; second, it injures the surface of the teeth by too harsh a friction, and, third, it deposits more germs of disease than it removes. Dr. Feldman advises the use of silk floss.

“If the tooth brush is as dangerous as he says, we ought to know it before the movement for tooth brush drills spreads through the schools of the country. We confess to a sense of shock at his charges. It is like hearing an old and trusted friend accused of treachery.”

A New York paper refers to this “condemnation of the tooth brush,” and assuming it to be merited, proceeds, on its own account, to give some advice to the public how to clean the teeth without the aid of a brush. To quote: “It is wise to *dip the cloth which acts a substitute for the brush in some powder sufficiently coarse to produce some grinding effect.* . . . Dental floss is a splendid material for substituting tooth brushes.”

These comments are published by ORAL HEALTH to show the widespread public interest taken in the problem of individual mouth cleanliness and the public oral hygiene campaign. This movement has assumed nation-wide proportions and has obtained the recognition and support of health boards, school authorities and public bodies everywhere.

It is no doubt true, as Dr. Feldman suggests, that the dental profession is somewhat at sea in discussing preventive measures. However, one cannot but doubt the wisdom of condemning and recalling the modern tooth brush until there is some degree of unanimity in the profession itself regarding some better article or method for accomplishing the desired result. However, the article will accomplish much in disturbing the quiet slumbers of many dentists who are satisfied to let “the other fellow” do their thinking, and will certainly be a stimulus to the further study of modern methods of oral hygiene and prophylaxis.

School Dentistry in a County Area *

BY C. DOSWELL WALLIS, L.D.S.R.C.S., ENG.

HOW TO DEAL WITH RURAL DISTRICTS.

SYNOPSIS.—Many methods to meet administrative difficulties and means of transport suggested—All more or less unsatisfactory—Attempt to formulate a method to include *all* parts of a county (whether urban or rural) in *one* scheme—Organization and inspection—Nature of the treatment centres proposed—Travelling difficulties discussed—Equipment necessary—Staff required—Cost of scheme.

MR. PRESIDENT AND GENTLEMEN.—I feel greatly honored to have been asked by the Secretary to read a paper dealing with some of the *administrative difficulties* encountered in arranging a successful *school dental service* in a *county area*.

I will do my best to present a few aspects of the subject as they appear to me, and I hope that the discussion may disclose many useful points. At present School Dentistry is so new, especially in county and rural districts, and one's opportunities of obtaining particulars are so imperfect, that it would be unwise to try to be at all dogmatic, since conditions of all kinds differ so very much in various localities that one can only hazard a few suggestions and generalizations.

Various methods have been suggested, and tried, to cope with the dental needs of school children in country districts—*e.g.*, by establishing permanent fully equipped treatment centres, either for each school area, or for each group of schools, or for some form of caravan, or by itinerant dentists visiting every individual school.

All these methods are open to various objections, and an ideal arrangement can only be arrived at by combining the good points of each into a comprehensive undertaking to meet as far as possible *all* the various requirements of a complex area like a county.

Large numbers of small centres are very expensive to equip in the first instance, and frequently do not justify the title "permanent," since they serve so small a number of children annually.

*Read before the School Dentist's Society, England.

The use of a caravan is open to so many and such grave objections that it may be considered to be impracticable. The suggestion recently made by Mr. Bailey, of St. Albans, for the use of a motor vehicle to convey the dentist, equipment, as well as the children, to a centre, though in many ways excellent, is (as far as I am able to judge) very much too expensive a method to be of practical value.

I read of a novel method of dealing with these difficulties at present adopted in Somerset. The idea seems to be that the dentist only examines and treats those children whose parents have previously notified that they are willing that such work may be carried out. Though this is a very ingenious, and, at first sight, plausible arrangement, as a matter of fact, it amounts to the *parents* selecting the cases to be treated by the dentist. In the very large majority of cases the children chosen would be those suffering from toothache, or those with gross and obvious defects in the dentition.

The whole object, I take it, of all the care devoted to children's teeth, and of the employment of skilled and highly trained specialists for this work, is to be able to detect dental disease in its initial stages, and to treat the defects at the earliest possible moment, while conservative operations are still possible. By adopting such a scheme as the one in use in Somerset, the children and their parents are deprived of the expert advice of the dentist, and have no opportunity of realizing that small defects exist which can be easily remedied by conservative treatment, so that as a rule the children would receive no attention till the mischief had progressed so far that extensive extraction is the only resource left.

The dentist also has not the opportunity of suggesting preventive measures, and impressing upon the parents and others the necessity of trying to keep *all* the teeth in the mouth, as well as in a functional condition.

The fundamental necessity of a successful scheme is to avail oneself to the utmost of local conditions, and so to organize the whole district that all may work harmoniously together, and as economically as possible. Probably the greatest difficulty to be encountered in making arrangements in a county area, is not so much providing for the needs of rural, or other particular districts, as having *one* method of procedure that will meet *all* these various conditions.

Of course co-operation with the school medical depart-

ment in the fullest sense is essential, though I still feel very strongly that it is a mistake for the medical officer to have control of the dental arrangements. Logically a dentist should be at the head of affairs, since he can realize the requirements of the case far better than any layman.

It would be wise to arrange that the same dentist should carry out all the inspections in any area, to ensure uniformity, and so greatly enhance the value of statistics. This dental surgeon (should the district be sufficiently large) might well devote his whole time to organizing, visiting schools, inspecting, and getting in touch with teachers and those interested in the work amongst children locally. This kind of work can only be successfully carried out by someone possessing considerable tact and experience, and it is obvious that a substantial salary should be offered for such a post.

The actual treatment could be carried out by whole- and part-time dental officers, as in all county areas there is a great deal more than one full-time dental surgeon can possibly hope to do.

As far as I am able to judge, it is not possible to get children (of from 6 to 9 years of age) to travel to a clinic farther than five miles, unless there is a particularly convenient train or motor-bus service, when they may occasionally come as far as ten miles or so.

In the remote country districts three miles is often the limit, as the roads are frequently in bad condition, and the children may have some miles to walk from home before reaching school. In the case of the very young children with whom we have often to deal, their parents, object, perhaps not unreasonably, to their travelling long distances, especially after teeth extraction.

I think it is clear, therefore, that, as far as possible, the treatment must be taken to the children, and the distances to be travelled by them reduced to a minimum. This object is best attained by establishing in suitable places, permanent treatment centres, supplemented by temporary centres; and in the more inaccessible and remote districts by one of the school dentists visiting the individual villages or schools.

The permanent centres should be in the large towns of the county, and, when possible, be held in the same building as, and form part of, the school medical clinic and dispensary. If geographical conditions make such an arrangement convenient, and supposing a county to be roughly rec-

tangular, a centre near each corner, and one about the middle, make a good arrangement.

Temporary centres should be established either in the larger villages, or at some central position, *e.g.*, where several roads meet, to supply a group of villages; these can also, frequently, be run in conjunction with the medical work.

One can often arrange for the use of a cookery-room, cloak-room, or lavatory, belonging to a school; these have water, drainage, etc., and in the former case hot water supply. It is also usually possible to borrow a class-room, or ante-room, for use as a waiting-room or recovery-room; but one must be guided entirely by the plan and general arrangements of the individual buildings.

If no suitable accommodation is available on the school premises, it may be possible to hire the village hall, church room, gymnasium, or some such place. These usually have hot and cold water supply, drainage, etc., are fairly roomy, and well known to all the people in the neighbourhood.

These arrangements still leave a small proportion of the schools unprovided for, the number of these more remote and isolated places being greater in agricultural districts, where the population is scattered. To meet the needs of these places it is probably best for a dentist to visit each individual school or village, and to take the necessary equipment with him. The treatment can very well be carried out on the school premises (when these are at all suitable).

The number of children requiring attention in each of these schools is, as a rule, so small that such a method interferes but little with the teaching, even if practically the whole of the school premises are used, each visit occupying only a short time; and this can sometimes be arranged in the midday interval. If the accommodation is quite unsuited to the purpose, possibly one of the school managers will be kind enough to lend a room for the purpose (kitchen or scullery), or one can get the use of a neighbouring cottage.

I wish, however, to emphasize strongly that in all these arrangements, success depends upon being able to appreciate the possibilities of the accommodation available, and to so adapt one's methods that the best results may be obtained.

With regard to equipment, the outfits provided by the dental depots, especially for school work, are all one could wish for use at the permanent clinics.

The details of the outfit are largely a matter of individual fancy. Personally mine is made up of goods from

various firms: *e.g.*, D.M. Co.'s chair; Ash's cabinet; instruments, stoppings, etc., of S. S. White's, Coy's, and others for which I have an individual fancy or am used to handling.

This outfit should be provided for, and remain constantly at *each* permanent clinic. That for the temporary clinics should be of such a nature that it can be readily moved from place to place, either by rail or carrier.

The Dental Manufacturing Co. have made a very excellent portable folding chair of steel tubing specially for this purpose. We spent a good deal of time and thought in perfecting it. The cabinet can be put complete into a special packing-case, preferably with the lid bolted on; and odds and ends can be put into a stout box (like a sugar-box) with a similar fixing for the lid. These should be sufficient to meet all requirements.

For use at school one can usually borrow a wooden arm-chair, but I am trying to get a collapsible chair made in armoured ash or larch that would be light, cheap, and portable. This, together with a case containing forceps and quite a small cabinet (like a student's), suitably fitted, should be sufficient for the purpose.

Nothing but quite simple operations would be attempted at school in these remoter districts. If more extensive or elaborate treatment were necessary in any individual case the child should attend the nearest clinic.

As already mentioned, the chief dental surgeon in a county should do *all* the inspections, and might, if time permits, be responsible for the treatment at outlying schools which require special visits. He should be provided with a motor-car for travelling about and conveying the necessary outfit, and, perhaps, at times with a nurse or clerk.

The permanent centres would be best and most economically served by appointing local dental practitioners as part-time officers; this avoids expense and loss of time through travelling, and allows for extension of the work as necessity arises.

The temporary centres might also very well be served in the same way, or one or more whole-time officers could be appointed to attend at the various places in turn (according to the size and school population of the area and other requirements). One of the ordinary school nurses could attend each of the permanent clinics to assist the dentist with treatment.

With regard to the other treatment centres, there are usually district nurses in the larger villages; or arrange-

ments can be made with some local nursing association for a nurse to attend the clinic.

Also at inspections the presence of the local nurse is valuable, as she usually knows and has influence with the parents, and can give them first-hand information of the defects pointed out by the dentist.

In many ways, however, this arrangement is unsatisfactory, as one may be left stranded at the last moment if nurse has to attend an urgent case, and besides one is constantly having to train fresh nurses, and being obliged to change to another as soon as one has got useful. Without doubt, on the whole, the fewer nurses employed in this work the better; and from the dentist's point of view probably an ideal arrangement would be to have a nurse specially trained to dental work amongst children as a full-time assistant.

Next we come to that vital consideration, *expense*. How much easier it would be to carry out an ideal scheme if one had unlimited resources! It is here, however, that great economy has to be exercised; but one must carefully guard against *false* economy, and look at the matter from all points of view in a broad-minded manner (*e.g.*, by adopting the comparatively expensive method of travelling by motor, the dentist will be able to do in most instances *twice* as much work as by other methods of travel, and will in this way save the expense of the salary of a second officer).

I think it must be obvious that any thorough and comprehensive scheme to deal efficiently with an extensive area and large population must involve considerable outlay.

Probably from all points of view, the best method to employ is to let the undertaking grow and develop from year to year. This plan is, perhaps, best attained by attending the infants in the schools each year as routines, and following up those children inspected in previous years. In this way, in the course of some six years all the children in the schools will be passing through the dentist's hands in the course of the twelvemonth; the time between successive inspections could then be gradually shortened to six months, if desirable. In this way the administrative and financial aspects of the scheme will develop easily from year to year, as the necessities of the case demand.

A Physician's Estimate of Modern Dentistry

WOODS HUTCHINSON, A.M., M.D., recently discussing the profession of dentistry and the relative susceptibility to dental disease of ancient and modern man, came to the rather unusual conclusion that prehistoric evidence is far from convincing that the teeth of moderns suffer more from the ravages of disease than those of the ancient. Dr. Hutchinson says:

The evidence for the decline of modern teeth which is furnished by an examination of ancient or prehistoric skulls dug up or uncovered in chance excavations is at first sight rather discouraging. The great majority of these are remarkably well stocked with teeth in a very fair state of repair. The percentage of missing or defective teeth is, on the whole, surprisingly small, ranging from 15 or 20 per cent. to as low as 2 per cent. And dental experts who have examined large collections of these skulls declare that hollow teeth or signs of dental abscess are less than half as common as they would be in a similar body of adults in a dental clinic to-day. But the first thing that strikes us about these ancient skulls is that the overwhelming majority of them are of men, and of men in the prime of young adult life at that—very few women's skulls, and practically no children's skulls at all. This used to be explained on the ground that they were from soldiers killed in some great battle, even though no record or legend had survived of a battle at that spot. But so constant is this overwhelming preponderance of young male skulls in all large collections dug up in the open earth that we are beginning to strongly suspect that we are dealing with a survival of only the strongest and solidest skulls, which would naturally be those of young men. And as the foundation and solidest part of the skull is its jaws, and the jaws depend entirely upon the teeth and waste away when the teeth are lost, the skull which would have the best chance of surviving would be, first of all, the young male adult; second, the young male adult skull which had the best and most perfect set of teeth.

At all events we are entitled to the consolation of knowing that even in this probably highly selected class of skulls, the overwhelming majority of which in any case are adult males in the prime of life, those who have survived the perils of childhood and adolescence and have not yet been decayed by the degeneration of advancing years—even

among this group of "champion" skulls, there are to be found every type of dental defect, of abscess, of pulp abscess, of indications showing that the teeth were lost by pyorrhea, of malpositions and irregularities of the teeth, and of failures of the jaws to grip and grind firmly and evenly one upon the other—technically known as malocclusion—which are known to civilized dentistry. So the difference between ancient and modern teeth shipwreck at best is only one of degree, not of kind.

But, when we lament that things were never half so bad as this in our father's or our grandfather's days, we are going beyond our evidence, because no examinations were ever made then. The teeth of school children only began to be systematically examined about fifteen or twenty years ago, and until about twenty-five or thirty years ago, no recruiting surgeon ever looked at a volunteer's teeth, except just to see that he had enough front teeth to tear open his old-fashioned paper cartridge with. Incidentally, it may be remarked that the great importance now attached to the condition of the teeth in recruits accounts for nine-tenths of the difference between the large number of rejections to-day and the smaller number fifty years ago.

MODERN METHODS FOR SCHOOL CHILDREN.

Thanks to the magnificent work now being done in school dental clinics and mouth hygiene movements, so that in some progressive towns and districts all the children's teeth in the community are being systematically and thoroughly examined, treated and recorded, we shall, twenty years from now have the data to make a comparison which will really give us reliable information. Personally, I don't mind hazarding the prophecy that it will show distinct improvement instead of deterioration.

THE PRACTICE OF MODERN DENTISTRY.

It must be remembered that it is only about thirty-five or forty-five years ago that the science of modern dentistry was born, and that dentists were invented and began to go about with a holy zeal for improvement, and tell us what terrible sets of teeth we kept. And few things have added more already to the comfort, the efficiency and the good looks of mankind than that same invention and crusade. Indeed, it is not too much to say that modern science has already checked or begun to check whatever decadence of modern teeth may have set in. How this has been done is almost a household word. Not only has the school dentist

and the army dentist and the prison dentist become a regular and indispensable institution, but many of our more intelligent employers of labor on a larger scale are establishing dental rooms and dental clinics upon their premises. Among the latest to join the procession are department stores, life insurance company headquarters and manufacturers. Fully equipped dental rooms are provided in the building, with dentists in constant attendance, who examine the teeth of all employes and do prophylactic or preventive work and then either refer cases requiring more extensive treatment to their private dentist, or make arrangements to do the work at moderate rates and let payments be made in weekly instalments.

Applicants for employment, if found satisfactory in other respects, are sent to the dentist for examination, and if dental defects are found, they are required to have these corrected, or to agree to have them attended to within a reasonable time, before they are appointed to a position. The reasons for this precaution and expenditure are straightforward and practical ones: First, that it has been found that putting the teeth in good condition and keeping them so improves the health and working power of the employee, and distinctly diminishes the number of days of absence on account of sickness throughout the year. The same had already been found true in school children in several of our cities, those who had gone to the dentist and had their teeth attended to, showing less than half the number of absences of those who had failed to heed such directions.

GOOD TEETH A BUSINESS ASSET.

The other reason is equally practical, though an esthetic one, and that is the much more attractive appearance presented by employes with white, lustrous and even sets of teeth, and the fact that customers prefer to be waited upon by clerks whose teeth are clean and fresh and wholesome looking, as well as their complexion and finger nails and attire. Besides, the girl who knows she has pretty teeth is usually more willing to display them in a smile, and as she is also free from the carping discomforts of toothache and ulcerated gums she is more likely to be affable and obliging in her demeanor.

In fact, these higher standards of dental deportment, both individual and general, have produced an appreciable effect already, and nowhere in the world can one see so universally perfect and sparkling and attractive sets of

teeth as upon the principal shopping streets of Canadian and American cities. And one of the most universal comments made on our women and girls by the visiting foreigners is the beauty, whiteness and evenness of their teeth.

Modern Methods of Producing Local Anesthesia

BY HERMAN PRINZ, M.B., D.D.S., PHILADELPHIA, PA.

(Continued from page 346, last issue)

As stated above, the relative toxicity of a given quantity of cocain in solution depends upon its concentration; this same peculiarity is not shared by novocain. The dose of novocain may be safely fixed at one-third of a grain for a single injection. For dental purposes of 1½- or a 2-per cent. solution in combination with adrenalin has been injected without any ill results. For the purpose of confining the injected novocain to a given area, the addition of adrenalin in small doses, on account of its powerful vasoconstrictor action, is well adapted. It is the important factor which prevents the ready absorption of both drugs and consequently largely nullifies poisonous results. An injection of ten drops of a 2 per cent. solution of novocain labially into the tissue produces a diffuse anesthesia lasting approximately twenty minutes; the same quantity, with the addition of one drop of adrenalin chlorid solution, increases the anesthetic period to over an hour, and localizes the effect upon the injected area.

A suitable solution of novocain for dental purposes may be prepared as follows:

Novocain	10 grains
Sodium chlorid	4 grains
Distilled water	1 fluid ounce
Boil.	

To each syringe-ful (two c.c.) add two drops adrenalin chlorid solution when used.

A sterile solution may be made extemporaneously by dissolving the necessary amount of novocain-adrenalin in tablet form in a given quantity of boiled distilled water. A suitable tablet may be prepared as follows:

Novocain	1-3 grain
Synthetic suprarenin hydrochlorid....	1-1200 grain
Sodium chlorid	1-3 grain

One tablet dissolved in 20 minims of sterile water makes a 2 per cent. solution of novocain ready for immediate use.

Solutions for hypodermic purposes should preferably be made fresh when needed. A small glass dish and a dropping bottle constitute the simple outfit for such work. The dropping bottle should hold from one to two ounces. A suitable one is made by the Whitall-Tatum Co., of Philadelphia, and may be bought in the drug shops. It should be provided with a dust cap. "A groove on one side of the neck of the bottle, and a vent on the other connected with two grooves in the back of the stopper allow the contents to flow out drop by drop. A quarter turn of the bottle closes the bottle tightly." The water used for making the solution should be boiled and filtered, distilled water. The hypodermic solution can be made extemporaneously in a few seconds: Place a tablet in a sterile glass dish, add 20 minims (1 c.c.) of water, and to facilitate the solution, mash the tablet. The solution is now ready for immediate use.

THE HYPODERMIC ARMAMENTARIUM.

A hypodermic syringe that answers all dental purposes equally well is an important factor in carrying out the correct technic of the injection. The injection into the dense gum tissue requires from 15 to 50, or even more, pounds of pressure as registered by an interposed dynamometer, while in pressure anesthesia 100 or more pounds are frequently applied.

The selection of a suitable hypodermic syringe is largely a matter of choice. All-glass syringes, glass barrel syringes, and all-metal syringes are the usual types found in the depots. After testing most of the dental hypodermic syringes offered in the dental depots within the last five years by means of the pressure gauge and in clinical work, subjecting the syringes to a routine wear and tear, the author has found that the all-metal syringes of the "imperial" types are to be preferred over other makes. They are usually made of nickel-plated brass, which, however, is a disadvantage, as the nickel readily wears off from the piston, and exposes the easily corroded brass. The Manhattan all-metal platinoid syringe gives the best general service, and we can conscientiously recommend it to our confreres. The syringe holds 40 minims (2 c.c.), is provided with a stronger finger cross-bar, and is extremely simple in

construction. The piston consists of a plain metal rod, without a thickened or ground piston-end or packing. The piston-rod is sufficiently long to allow about two inches of space between the cross-bar and the piston-top. This space is of importance, as it allows the last drop of the fluid to be expelled under heavy pressure without tiring the fingers. The packing consists of leather washers inserted at the screw point, and are quickly removed and replaced if necessary.

The hypodermic syringe requires careful attention. It is not necessary to sterilize it by boiling after each use, unless it be contaminated with blood or pus. The simple repeated washings with alcohol and careful drying is sufficient. The cap is readjusted, and the piston-rod is covered with a thin film of carbonated vaseline, or surgical lubricating jelly, and placed in position. If the syringe is boiled, all the washers must be removed. The syringe is best kept in a covered glass or metal case, and a large bacteriologic Petri dish is suitable for this purpose. Leather-lined or felt-lined boxes afford breeding places for bacteria. Some operators prefer to constantly keep their syringes in an antiseptic solution when not in use, and others prefer to place them in a special sterilizing bottle, which bottles may now be purchased at dental depots.

Dental hypodermic needles should be made preferably of seamless steel, or, still better, of nickel steel, 26 to 28 B. & S. gauge, and provided with a short razor-edge point. Thicker needles cause unnecessary pain, and thinner needles are liable to break. Iridio-platinum needles are preferred by some operators, as they may be readily sterilized in an open flame. The needle should measure from a quarter to a half inch. For infiltration anesthesia one-inch needles are necessary, and curved needles of various shapes are essential in reaching the posterior parts of the mouth. The "Schimmel" needles are excellent, but do not, however, fit every syringe. For pressure anesthesia special needles are required, and may be bought at the depots, or quickly prepared by grinding off the steel needle at its points of reinforcement. The sterile needle should be kept in well-protected glass containers. The needles are sterilized after each use by boiling in plain water, dried with the hot air syringe, and immediately transferred to a covered sterile glass dish. The sterile needles should not be again touched with the fingers, and the customary wire insertion is unnecessary.

TECHNIC OF INJECTION.

Various methods of injecting the anesthetic solution about the teeth are in vogue. For the sake of convenience we may be permitted to divide them as follows:

The subperiosteal injection.

The periodental injection.

The intraosseous injection.

The perineurial injection.

The injection into the pulp.

Before starting any surgical interference in the mouth, the field of operation should be thoroughly cleansed with an antiseptic solution. A thin coat of the official tincture of iodine painted over the surface is very useful for this purpose. After the diagnosis is made the method of injection best suited for the case on hand is then decided. The necessary quantity and the concentration of the anesthetic solution is now prepared, and the syringe and hypodermic needle fitted ready for the work. To facilitate the ready penetration of the needle into the tissues, its point may be coated with carbolated vaseline. The correct position of the syringe in the hands of the operator and its proper manipulation is an important factor and has to be acquired by practice. The hand holding the syringe is exclusively governed in its movements by the wrist, so as to allow delicate and steady movements, and the fingers must be trained to a highly developed sense of touch. The syringe is filled by drawing the solution up into it; it is held perpendicularly, point up, and the piston is pushed until the first drop appears at the needle point, which precaution prevents the injection of air into the tissue.

THE SUBPERIOSTEAL INJECTION.

The subperiosteal injection about the root of an anterior tooth is best started by inserting the needle midway between the gingival margin and the approximate location of the apex. The pain of the first puncture may be obviated by a fine, very sharp-pointed needle, the simple compression of the gum tissue with the finger tip, by holding a pledget of cotton saturated with the prepared anesthetic solution on the gum tissue for a few moments, or by applying a very small drop of liquid phenol on the point of puncture. The needle opening faces the bone, the syringe is held in the right hand at an acute angle with the long axis of the tooth, while the left hand holds the lip and cheek out of the way. After puncturing the mucosa, a drop of the liquid is at

once deposited in the tissue, and the further injection is painless. Slowly and steadily the needle is forced through the gum tissue and periosteum along the alveolar bone toward the apex of the tooth, depositing the liquid under pressure close to the bone on its upward and return trip. The continuous slow moving of the needle prevents injecting into a vein. A second injection may be made by partially withdrawing the needle from the puncture and swinging the syringe anteriorly or posteriorly, as the case may be, from the first route of the injection. This latter method is especially indicated in injecting the upper molars. After removing the needle, place the finger tip over the puncture and slightly massage the injected area. A circular elevation outlines the injected field. The naturally pink color of the gum will shortly change to a quite anemic hue, indicating the physiological action of the adrenalin on the circulation. No wheal should be raised by the fluid, as that would indicate superficial infiltration and consequently failure of the anesthetic.

As the liquid requires a definite length of time to pass through the bone lamina and to reach the nerves of the periodontal membrane and the pulp, from five to ten minutes should be allowed before the extraction is started. The length of time depends on the density of the surrounding structure of the tooth. The progress of the anesthesia may be tested with a fine-pointed probe, and its completeness indicates the time when the extraction should be started.

The upper eight anterior teeth usually require a labial injection only, while the molars require both a buccal and a palatine injection, using a slightly curved needle for this purpose. Buccally, the injection is made midway between the mesial and distal root, and on the palatine side over the palatine root.

The lower eight anterior teeth are comparatively easily reached by the injection. The straight needle is inserted near the apex of the tooth, the syringe is held in a more horizontal position, and the injection proceeds now as outlined above.

The lower molars require a buccal and lingual injection. The curved needle is inserted midway between the roots, the gum margin, and the apices. The external and internal oblique lines materially hinder the ready penetration of the injected fluid, and therefore ample time should be allowed for its absorption.

If two or more adjacent teeth are to be removed, the

injection by means of infiltrating the area, the gum fold directly over the apices of the teeth, is to be preferred. It is advisable to use a one-inch needle for this purpose, holding the syringe in a horizontal position, so as to reach a larger field with a single injection.

The injection into inflamed tissue, into an abscess, and into phlegmonous infiltration about the teeth is to be avoided. The injection into engorged tissue is very painful; the dilated vessels quickly absorb cocain without producing a complete anesthesia, and generally poisoning may be the result. In purulent conditions the injection is decidedly dangerous, as it forces the injection beyond the line of demarcation. If the abscess presents a definite outline, the injection has to be made into the sound tissue surrounding the focus of infiltration. If a tooth is affected with acute, diffuse or purulent pericementitis, a distal and a mesial injection usually produces successful anesthesia by blocking the sensory nerve fibers in all directions.

PERIDONTAL ANESTHESIA.

The teeth or roots standing singly, or teeth affected by pyorrhea or similar chronic peridental disturbances, are frequently, quickly and satisfactorily anesthetized by injecting the fluid directly into the peridental membrane. This method is known as peridental anesthesia, and its technic is very simple. In single-rooted teeth a fine and short hypodermic needle is inserted under the free margin of the gum, or through the interdental papilla, into the peridental membrane between the tooth and the alveolar wall. Sometimes the needle may be forced through the thin alveolar bone so as to reach the peridental membrane direct. To gain access to this membrane in teeth set close together, separation is essential. It may be accomplished with an orange wood stick or by any of the various mechanical separators. By so doing the body of the tooth is shifted to one side and thereby creating a slight space between it and the alveolar process. The injection is now made directly into the exposed peridental membrane. By reversing the separator, the tooth is shifted to the opposite side and the injected liquid is forced toward the apex of the tooth.

A second injection is now made in this freshly exposed portion of the peridental membrane. Two, sometimes three, injections are necessary. To force the liquid into the membrane usually requires a higher pressure than that which is necessary for injecting into the periosteum covering the alveolar process, but the quantity of the anesthetic fluid is

less than that which is required for the former injection. Acute inflammatory conditions of the peridental membrane and its sequelæ prohibit the use of this method. Peridental anesthesia is the purest form of local anesthesia, since the seat of the nerve supply of the tooth is very quickly reached, and as a consequence the results obtained are in the majority of cases extremely satisfactory, provided that general conditions justify its application. The method is especially serviceable for the removal of pulps in all such cases where contact anesthesia is not indicated or for temporarily desensitizing a tooth for operative procedures.

INTRAOSSSEOUS INJECTION.

To facilitate the passage of the injected fluid into the bone structure proper, Otte, in 1896, recommended a method by which he forces the anesthetic solution directly into the spongy cancelloid bone. Otte terms this procedure the intraosseous method of injection, and its technic is described by him as follows: After the gum tissue is thoroughly cleansed with an antiseptic solution, it is anesthetized about the neck of the tooth in the usual manner. After waiting two or three minutes, an opening is made into the gum tissue and the bone on the buccal side with a fine spear drill or a Gates-Glidden drill. The opening should be made more or less at a right angle with the long axis of the tooth, a little below the apical foramen in single-rooted teeth or between the bifurcation in the molars. The right-angle hand piece is preferably employed for this purpose. The drill should be of the same diameter as the hypodermic needle. The gum fold is tightly stretched to avoid laceration from the rapidly revolving drill.

As soon as the alveolar process is penetrated, a peculiar sensation conveyed to the guiding hand indicates that the alveolus proper is reached, and the sensation felt by the hand is about the same as that experienced when a bur enters the pulp chamber. In this artificial canal the close fitting curved needle of the hypodermic syringe is now inserted, and the injection is made in the ordinary way. The quantity of fluid used is much less than is usually needed for a subperiosteal injection. The roots of the teeth are imbedded in a sieve-like mass of bone tissue (diploe), which allows a ready penetration of fluid when injected under pressure. Very recently, Masselink advocates this method of the anesthetization of any tooth in the mouth either for the purpose of extracting or the removal of its pulp. He employs a No. ½ round bur for penetrating the alveolar plate

and a very short needle (about 1-16 of an inch) with a dull point for the injection.

PERINEURIAL INJECTION.

For the anesthetization of a number of teeth in the upper or the lower jaw, conductive anesthesia by means of perineurial injection is preferably employed. The perineurial injection is made near the point of exit or entrance of the various nerves about their respective foramina. To anesthetize all the teeth of one-half of the upper jaw four injections are necessary, i.e., two buccally and two on the palatine side of the bone. A one-inch needle is required for such work. To reach the many small branches of the posterior dental nerves at the alveolar foramina, the injection is made buccally over the region of the tuberosity about $\frac{1}{2}$ inch above the gingival line between the first and second molar teeth.

The second injection is made below the infraorbital foramen, so as to reach the middle and anterior dental nerves. With the index finger of the left hand the foramen is approximately located by exerting pressure upon the nerve-exit. The lip is lifted up with the middle finger of the same hand and the needle is now inserted between the apices of the cuspid and first bicuspid teeth. The needle is slowly pushed forward until its point is felt beneath the finger tip. To reach the nerve supply of the hard palate one injection is made near the posterior palatine canal, and the other near the foramina of Scarpa. The great palatine nerves pass through the posterior palatine canals on either side of the hard palate. The canals lie about three-eighths of an inch above the edge of the alveolar process and the last molar tooth. They move posteriorly with the eruption of the successive teeth. The nasopalatine nerves pass through the foramina of Scarpa (incisive foramen) which are situated in the line of the suture of the maxillary bones. If an imaginary line is drawn from the distal borders of the two cuspids and passing over the hard palate, the line will ordinarily pass through the foramina. The needle should be inserted directly back of the papilla, which lies posteriorly between the central incisor teeth.

To anesthetize one-half of the mandible, three injections for the deposition of the anesthetic solution are necessary. The first injection is applied near the mandibular foramina, the second near the mental foramen, and the third into the incisive fossa. To locate the mandibular foramen in the mouth, the lingual surface of the ramus is palpated with

the finger, the anterior sharp border of the coronoid process is easily felt about five-eighths of an inch posterior of the third molar. The process passes downward and backward of the third molar, and enters into the external oblique line. Mesially from this ridge is to be found a small triangular concave plateau, which is facing downward and outward, being bound mesially by a distinct bony ridge, and covered with mucous membrane. As there is no anatomical name attached to this space, Braun has called it the retromolar triangle (*trigonum retromolare*). In the closed mouth it is located at the side of the upper third molar, and in the open mouth it is found midway between the upper and lower teeth. Immediately back of the mesial border of this triangle, directly beneath the mucous membrane, lies the lingual nerve, and about three-eighths of an inch farther back the mandibular nerve is to be found. This last nerve lies close to the bone, and enters into the mandibular foramen, which is partly covered by the mandibular spine.

Before starting the injection the patient should be cautioned to rest his head quietly on the head-rest of the chair, as any sudden movement or interference with the hand of the operator may be the cause of breaking the needle in the tissue. The syringe, provided with a one-inch needle, is held in a horizontal position, resting on the occluding surfaces of the teeth from the cuspid backward and slightly toward the median line. The needle is to be inserted three-eighths of an inch above and the same distance back of the occluding surface of the third lower molar, the needle opening facing the bone. This position will insure the correct direction of the needle point so as to reach the tissues immediately surrounding the nerves, and not lose the injection in the adjacent thick muscle tissue. The needle must always be in close touch with the bone, and is now slowly pushed forward, depositing a few drops of fluid on its way until the ridge is reached. About five drops of fluid are injected in this immediate neighborhood for the purpose of anesthetizing the lingual nerve. The needle is pushed very slowly forward, always keeping in close touch with the bone and depositing fluid on its way, until it is pushed in about five-eighths of an inch. It is important carefully to feel the way along the bony wall of the ramus, as the needle may have to pass over the roughened and bony elevations, which afford attachment to the internal pterygoid muscle. During the injection the syringe should remain in the same horizontal position as heretofore outlined.

Soon after the injection paresthesia of one-half of the tongue on the side of the injection occurs, which is soon followed by anesthesia of the mandibular nerve. Paresthesia of the mucous membrane and half of the lower lip is also established. The pulps of the lower teeth, including the cuspid and lateral incisor and the gum tissue on both sides of the jaw, are anesthetized, including a part of the anterior floor of the mouth. The complete anesthesia of the two nerves also anesthetizes the whole alveolar process in this region. About five minutes are required for the complete anesthetization of the lingual nerve, and at least fifteen minutes for the mandibular nerve. Braun claims that the injection is absolutely free from danger, while Romer states that danger may arise if the whole quantity of the solution should accidentally be injected into a vein.

The mental foramen lies midway between the superior and inferior border of the body of the mandible on its external surface, usually below the second bicuspid teeth. Its opening always faces posteriorly. An injection near this point increases the anesthesia in the bicuspid region. The incisive fossa is a shallow depression of the external surface of the mandible between the cuspid teeth. It may be located by the palpating finger immediately above the chin. A number of small foramina are found in this region for the passage of nerves and nutrient vessels. The lower incisors may be anesthetized by making injections anteriorly into the incisive fossa and one posteriorly in the region corresponding to the fossa. Usually, peridental anesthesia is to be preferred for these teeth.

Conductive anesthesia is serviceable if a number of teeth have to be removed at one visit. It should be borne in mind, however, that in average, only one-half of either jaw should be anesthetized at one sitting so as to keep the quantity of the injected anesthetic solution within the limits of ordinary dosage.

THE INJECTION INTO THE PULP.

By pressure anesthesia, pressure cataphoresis, or contact anesthesia, as the process is variously termed, we understand the introduction of a local anesthetizing agent in solution by mechanical means through the dentin into the pulp for the purpose of rendering this latter organ insensible to pain. Simple hand pressure with a suitable instrument, the hypodermic syringe or the so-called high pressure syringe, is recommended for such purposes. Regarding the principles of pressure anesthesia, it should be remembered that

we cannot force a liquid through healthy dentin by a mechanical device without injury to the tooth itself. If a cocain solution is held in close contact with the protoplasmic fibres of the dentin, the absorption of cocain takes place in accordance with the law of osmosis. The inhibition of the anesthetic is enhanced by employing a physiological salt solution as a vehicle. On the other hand, living protoplasm reacts unfavorably against the ready absorption of substances by osmosis for two reasons: (1) Its albumen molecule is relatively large and not easily diffusible, and (2) as an integral part of its life it possesses "vital" resistance toward foreign bodies. These latter factors are sufficiently demonstrated by the fact that it is very difficult to stain living tissue. Dehydration of the protoplasm increases the endosmosis of the anesthetic solution markedly.

When we apply the same "pressure" anesthesia upon carious dentin the above statements do not hold good. We are able to press fluids quite readily through carious dentin. We must bear in mind that such dentin has been largely deprived of its inorganic salts, leaving an elastic spongy matrix in position. By drying out this dentin and then confining the anesthetic solution under a suitable water-tight cover, the pressure applied by the finger is quite sufficient to obtain the results. Colored fluids may be readily pressed through such dentin and even stain the pulp.

In teeth not fully calcified and in so-called soft teeth, pressure anesthesia is more readily obtained while, according to Zederbaum, the process fails in "teeth of old persons, teeth of inveterate tobacco chewers, worn, abraded and eroded teeth, teeth with extensive secondary calcific deposits, teeth whose pulp canals are obstructed by pulp nodules, teeth with metallic oxides in tubules, teeth with leaky old fillings, badly calcified teeth—mainly all from one and the same cause, namely, clogged tubuli. In most cases no amount of persistent pressure will prove successful."

From the foregoing it will be observed that the so-called high pressure syringes possess little merit relative to pressure anesthesia. The pressure which can be produced by a good working all-metal syringe, holding it between the index and middle fingers and forcing the piston with the thumb, amounts to 250 to 300 pounds in the average man. The pressure required in pressure anesthesia to produce a perfect contact is usually much less than the above force.

METHODS OF ANESTHETIZING THE PULP.

1. The pulp is wholly or partially exposed: Isolate the

tooth with the rubber dam and clean it with water and alcohol. Excavate the cavity as much as possible and if the pulp is not exposed, dehydrate with alcohol and hot air. Saturate a pledget of cotton or a piece of spunk with a concentrated cocain or novocain solution, place it in the prepared cavity and cover it with a piece of vulcanizable rubber and with a suitable burnisher apply slowly, increasing continuous pressure from one to three minutes. The pulp may now be exposed and tested. If it is still sensitive, repeat the process. Loeffler states that "this pressure may be applied by taking a short piece of orange wood, fit it into the cavity as prepared, and direct the patient to bite down upon this with increasing force. In this way we can obtain a well-directed regulated force or pressure, and with less discomfort to the patient and operator." Miller described this process as follows: "After excavating the cavity as far as convenient and smoothing the borders of it, take an impression in modeling compound, endeavoring to get the margins of the cavity fairly well brought out; put a few threads of cotton into the cavity and saturate them thoroughly with a 5 to 10 per cent. solution of cocain; cover this with a small bit of rubber dam, and then press the compound impression down upon it. We obtain thereby a perfect closure of the margin, so that the liquid cannot escape and one can then exert pressure with the thumb sufficient to press the solution into the dentin."

2. The pulp is covered with a thick layer of healthy dentin: With a very small spade drill bore through the enamel or direct into the dentin at a most convenient place, guiding the drill in the direction of the pulp chamber. Blow out the chips, dehydrate with alcohol and hot air, and apply the syringe provided with a special needle, having as nearly as possible a water-tight point. Apply slow continuous pressure from two to three minutes. With a round bur the pulp should now be exposed, and if still found sensitive, the process is to be repeated.

Recently a method has come into vogue which allows successful anesthetization of the pulp by injecting the anesthetic solution around the apex of the tooth. The spongy alveolar process, which contains lymph channels, allows the ready penetration of the fluid. The injection should be made close to the bone, pushing the needle slowly toward the apex, while the fluid is deposited drop by drop. No wheal should be raised by the injection, otherwise the benefits of the pressure from the dense gum tissue is lost.

According to Hertwig, the protoplasm of the cell primarily transfers irritation and, secondly, transmits absorbed materials. Therefore, the anesthetic solution has to pass through the entire dentinal fibre before the nerve tissue of the pulp proper is reached. Consequently a certain period of time is required before the physiological effect of the anesthetic is manifested. This period of latency is dependent upon the thickness of the intermediate layer of dentin or bone. The successful anesthetization of the pulp depends largely upon this most important factor of allowing sufficient time for the proper migration and action of the drug.

The anesthetizing of the peridental membrane for the treatment of pyorrhea alveolaris is a comparatively simple matter if carried out according to the methods as outlined under the heading of peridental anesthesia. Sometimes a topical application of a fairly concentrated novocain-adrenalin solution (about 10 per cent.) and applied to the pockets by means of cotton ropes accomplishes the desired purpose. The surgical treatment of pyorrhea is materially simplified if the tissues under consideration are relieved of sensation.

LOCAL ANESTHESIA FOR OPERATIONS ABOUT THE MOUTH, EXCLUSIVE OF THE EXTRACTION OF TEETH.

In operating about the mouth for an abscess, a cystic or a solid tumor of the approximate size of a large walnut, a malposed tooth, or for any other purpose, the rhomboid infiltration according to Hackenbruch affords the simplest means of producing a most satisfactory anesthesia. After previously cleansing the field of operation with an antiseptic solution, a very small drop of phenol is placed at A and B to superficially obtund the point of puncture. The needle is quickly thrust through the mucosa at A, and at once slow pressure is exerted on the piston, moving the needle steadily along the external line of the tumor. The needle is now partially withdrawn, without, however, leaving the original puncture, and a second injection or as many as may be needed are made in opposite directions. This maneuver is now repeated at B, and thus a circumscribed infiltration of the whole tumor is obtained. If the tumor, etc., is very large, additional punctures and injections may be made as outlined in the schematic drawing. After ten to fifteen minutes' waiting, the extirpation of the tumor may be begun. For injecting the soft tissues other than the gum, a 1 per cent. novocain-adrenalin solution—one tablet dissolved in 2 c.c. of water—is quite sufficient.

The anesthetization of the soft and hard palate is comparatively easily accomplished. The injection on the hard palate is started at the gingival edge of the alveolar periosteum on both sides of the jaw toward the median line. As the gum tissue is extremely dense, great force is required for a complete infiltration in this region, and only small quantities of the solution are required. The soft palate is easily infiltrated by inserting the curved needle posteriorly to the third molar.

Small tumors and cysts on the tongue or the floor of the mouth are best anesthetized by the rhomboid infiltration of Hackenbruch. For the complete extirpation of a ranula, the injection is made into the cyst wall near the periphery, after which the cyst is slit open and a small quantity of the anesthetic solution is injected into the inner surface of the cyst. Large cysts, tumors, and major operations on the tongue require the anesthetization of both lingual nerves. In injecting and operating on the floor of the mouth, the index finger of the left hand should be placed on its external surface as a guide to the needle or the knife.

Local anesthesia is indicated in all minor and in relatively many major operations on the mucous surfaces, the skin, and the teeth. Local anesthesia is not a substitute for general anesthesia; its usefulness is materially increased by familiarizing one's self with the modern methods of its production and with a perfect mastering of the technic. The danger of poisoning has been practically eliminated by using isotonic solutions containing a relatively small percentage of the anesthetic in combination with the alkaloid of the suprarenal capsule. Even if the danger of general necrosis is small under the very best conditions, the danger from local anesthesia is always less. The greater majority of all dental operations can be safely carried out under local anesthesia, provided the operator has acquired a complete working knowledge of the various components which, as a whole, constitute this important branch of dental therapeutics.—*The Dental Summary*.

New York.

At the Morris High School Auditorium, Dr. Eugene L. Fiske, Director of the Hygiene Life Extension Institute, delivered a public lecture upon "Oral Hygiene in Relation to General Health." and Dr. M. H. Feldman, President Northern District Dental Society, addressed those present upon "How to Practice Oral Hygiene."

First Annual Report of the Dental Committee of the Bridgeport (Ct.) Board of Health

TO the Bridgeport Board of Health.

Gentlemen,—On May 1st a report was rendered you of our work from September, 1914, to April 1st, 1915, which was the end of the financial year. We now submit an annual report which gives in some detail the work for the entire school year.

The dental corps working in the schools, as you know, comprised eight women prophylactic operators and two women supervisors. The latter part of the second week in April a ninth woman operator was added to the number.

The total number of individual children given prophylactic treatments was 6,768. The number given one treatment was 1,872, the number given two treatments, 2,116 and the number given three or more treatments, 2,780. The total number of prophylactic treatments given was 14,340.

The supervisors gave tooth brush drills from October to June 20th to 12,546 children.

Stereoptican lectures were given by Drs. R. H. W. Strang and A. C. Fones to 7,447 children.

Ninety-seven individual children who were too poor to pay for dental services were relieved from toothache by Dr. Henry S. Riddell. The operations performed were as follows:

Extractions	142	teeth
Treatments	11	“
Root fillings	9	“
Cement fillings	21	“
Amalgam fillings	1	“

The total cost of this service amounted to \$100.50.

We appreciate that it is difficult to show at the end of the first year anything of great interest regarding our work as it will take time to make pronounced comparisons, yet a study of the following tables, especially of the last one where a comparison can be shown, will prove that there is every promise of this service and education being of great value to the children of our city. The following table gives the details of our findings of the 6,768 children on the first examination of their mouths.

STATE OF TEETH			COLOR OF GUMS			FISTULAS SHOWING ABSCESSSED TEETH	CASES OF MAL- OCCLUSION
Clean	Fair	Dirty	D'k Red	Lgt Red	Pink		
401	2647	3720	1573	4731	464	691	6077

THE USE OF THE TOOTH BRUSH			CAVITIES	
Daily	Occasionally	Not Used	In Temporary Teeth	In Permanent Teeth
653	2149	3966	36700	4555

The following table is of more interest as it shows a comparison of the mouths of the 2,780 children who have had three or more prophylactic treatments during the year.

Totals of First and Last Examinations of Children Receiving Three or More Prophylactic Treatments during the Year.

STATE OF TEETH						COLOR OF GUMS					
First Examination			Last Examination			First Examination			Last Examination		
Clean	Fair	Dirty	Clean	Fair	Dirty	D'k Red	Lgt Red	Pink	D'k Red	Lgt Red	Pink
186	1067	1527	873	1769	143	647	1897	236	273	1981	526
FISTULAS						MALOCCLUSION					
First Examination			Last Examination			2494					
317			336								

USE OF THE TOOTH BRUSH

First Examination			Last Examination		
Daily	Occasionally	Not Used	Daily	Occasionally	Not Used
252	696	1832	763	1831	186

CAVITIES				INCREASED NUMBER OF CAVITIES	
First Examination		Last Examination		Temporary Teeth	Permanent Teeth
Temporary Teeth	Permanent Teeth	Temporary Teeth	Permanent Teeth	1623	499
15547	1027	17170	1526		

It will be noted that the increase of cavities in the teeth during the year has been considerably less than one cavity per child. When we consider how easily a decayed tooth will incite decay in a neighboring tooth, we feel that this

increase is comparatively small. A large number of the children developed no new cavities.

A number of the teachers have informed us that it is the first year that they have not had a large number of absentees on account of toothache. As time goes on we believe that the physical condition of the children will be much improved and infectious diseases much lessened with clean mouths and sound teeth.

The most important product of our city, barring none, is children. A close study of the first table will convince us that there is much to be done if we would hope to secure health and efficiency for the coming generation.

Respectfully submitted,

F. W. STEVENS, M.D.

R. H. W. STRANG, M.D., D.D.S.

T. A. GANUNG, D.D.S.

W. J. McLAUGHLIN, D.D.S.

A. C. FOXES, D.D.S., Chairman.

July 1st, 1915.

The Canadian Army Dental Fund

THE profession is making a splendid response to the appeal issued in behalf of the Canadian Army Dental Corps by the committee representing the Canadian Dental Association. The vacation months have no doubt interfered with the canvass in some of the Provinces, but it is hoped that returns will be available in the near future from every Province in the Dominion.

Since the publication of the last list of subscribers, the following subscriptions have been sent in:

British Columbia—

P. C. Thomas, Vancouver	\$ 2.50
Geo. Telford, Vancouver	5.00
F. B. Miles, Cranbrook	5.00
J. E. Black, Vancouver	5.00
W. S. Kobe, Vancouver	1.00
W. B. Steed, Nelson	10.00
Garry, Kamloops	10.00
S. B. Badgers, Smithers	5.00

New Brunswick—

M. Magee, St. John	\$ 10.00
H. W. Snow, Sackville	5.00
H. S. Thomson, Moncton	5.00
G. T. Leighton, Moncton	5.00
B. F. Reade, Moncton	5.00
C. A. Murray, Moncton	5.00

F. A. Taylor, Moncton	5.00
O. B. Price, Moncton	5.00
L. Somers, Moncton	5.00
F. E. Burden, Moncton	5.00
A. J. Cormier, Moncton	5.00
J. B. Crocker, Fredericton	10.00
W. A. Greene, Fredericton	5.00
W. J. Irvine, Fredericton	5.00
W. H. Steeves, Fredericton	5.00
F. W. Barbour, Fredericton	20.00

Nova Scotia—

H. W. Black, Truro	\$ 10.00
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Ontario—

F. C. VanDuzer, Toronto	\$ 10.00
Canadian Oral Prophylactic Assn.	100.00
G. L. Ball, Toronto	5.00
W. J. Woods, Toronto	5.00
A. M. Weldon, Toronto	5.00
W. C. Smith, Toronto	10.00
L. F. Kruger, Toronto	10.00
P. C. Smith, Toronto	5.00
Fred J. Conboy, Toronto	10.00
F. R. Davis, Toronto	5.00
R. D. Thornton, Toronto	5.00
Chas. E. Pearson, Toronto	25.00
Harold Clark, Toronto	25.00
S. S. Louckes, Meaford	5.00
R. R. Elliott, Preston	5.00
A. D. A. Mason, Toronto	15.00
W. T. Willard, Toronto	15.00
R. Jarvis, London	10.00
N. S. Coyne, Toronto	5.00
R. N. Berry, Caledonia	10.00
T. H. Lewis, Jarvis	5.00
R. E. Stewart, Elmira	2.00
W. J. Cooper, Toronto	5.00
H. J. M. Bannerman, Owen Sound	5.00
F. E. Risdon, Toronto	5.00
W. N. Brown, Toronto	5.00
H. C. Duffin, Toronto	5.00
R. J. Kenny, Toronto	10.00
W. A. Day, Belleville	5.00
M. J. Clark, Belleville	5.00
O. A. Marshall, Belleville	5.00
Jos. Caldwell, Belleville	5.00
Dupreau, Belleville	10.00
J. M. Wilson, Belleville	5.00
C. A. Snell, Essex	10.00
D. R. Nethercott, Stratford	5.00
J. R. Hill, Brantford	10.00
In memory of J. B. Willmott, Toronto.....	50.00
Mrs. (Dr.) J. B. Willmott, Toronto	25.00
Dr. W. E. Willmott, Toronto	25.00
G. H. Ross, Wingham	5.00
S. S. Davidson, Ottawa	10.00
G. A. Adams, West Toronto	10.00
W. Burnett, Galt	5.00
L. A. Barrett, Galt	5.00
W. S. McKay, Galt	5.00

F. F. Campbell, Galt	5.00
Jas. Durran, Galt	10.00
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G. B. Towell, Guelph	10.00
D. M. Foster, Guelph	10.00
M. J. Ruddell, Guelph	5.00
H. C. Skinner, Guelph	5.00

The General Treasurer, Dr. C. V. Snelgrove, reports that total moneys subscribed to date are as follows:

Donations sent direct to Lieut.-Col, Armstrong, Ottawa	\$ 303.27
Donations received by Treasurer, from	
British Columbia	\$ 58.50
New Brunswick	105.00
Nova Scotia	10.00
Ontario	1,818.36
	<hr/> 1,991.86
Total	<hr/> \$2,295.13

Dominion Dental Council

EXAMINATION RESULTS.

THE following candidates have been reported by Dr. W. D. Cowan, Secty.-Treas. of the D.D.C., as having been successful in passing the Dominion Dental Council in the subjects indicated. Twelve candidates completed the examination this year and will receive the D. D. C. Certificate:

Prosthetic Dentistry—Practical.—Atkinson, R., Hurst, A. R., Hammel, W. R., McLellan, T. J., McGrory, T. S., Leggo, A. R., Lawson, F. J., Lough, A. G., Robinson, H. J., Stitt, H., Stewart, J. A., Thompson, H. A., Tucker, T. S., Wright, F. J., Woodbury, K. F.

Operative Dentistry—Practical.—Atkinson, R., Hurst, A. R., Hammel, D. H., McLellan, T. F., McGrory, F. S., Leggo, A. R., Lawson, F. J., Lough, A. G., Robinson, H. J., Stitt, H., Stewart, J. A., Thompson, H. A., Tucker, T. S., Wright, F. J., Woodbury, K. F.

Pathology only.—McCarten, T. G., Stewart, J. A.

Bacteriology only.—Cowan, W. A., McKay, D. A. P.

Metallurgy only.—Cowan, W. A., McKay, D. A. P.

Jurisprudence and Ethics.—Bradley, S. W., Hurst, A. R., McLellan, T. F., McCarten, T. G., Leggo, A. R., Lawson, T. J., Stitt, H., Stewart, A. J., Schwalm, H. V., Taylor, R. F., Tucker, T. S., Wright, F. J.

Physics and Chemistry.—Alyoe, H. R., Barbour, R. M. Bell, F. E., Berry, E. G., Bradley, S. W., Bier, E. R., Crosby, R. C., Cowan, W. A., Eaid, B. E., Fergusson, H. V., Grant, C. L., Garvin, F. G., Hoffman, R. W., Hurst, A. R., James, H., McKay, D. A. P., Ryan, J., Stitt, H., Steele, A. C., Taylor, R. F., Thompson, H. A., Tucker, T. S.

Medicine and Surgery only.—Stewart, J. A.

Medicine, Surgery and Anesthetics.—Baird, W. F., Hurst, A. R., Leggo, A. R., Lawson, F. J., Stitt, H., Schwalm, H. V., Thompson, H. A., Tucker, T. S.

Physiology and Histology.—Alyoe, H. R., Berry, E. G., Beir, E. R., Crosby, R. C., Cowan, W. A., Eaid, R. E., Fergusson, H. V., Garvin, F. G., James, H., McKay, D. A. P., Stitt, H., Steele, A. C., Sproule, G. A., Tucker, T. S.

Anatomy.—Barbour, R. M., Bell, T. E., Bradley, S. W., Davidson, L. R., Denon, E. R., Fergusson, H. V., Graham, C. C., Hoffman, R. W., Hurst, A. R., McKay, D. A. P., Morton, A. L., Oliver, E. J., Ryan, J., Steele, A. C., Stitt, H., Taylor, R. F., Williamson, F. W.

Materia Medica and Therapeutics.—Alyoe, H. R., Berry, E. G., Beir, E. R., Eaid, B. E., Fraser, W. R., Grant, C. L., Garvin, F. G., Hurst, A. R., James, H., McLellan, T. F., Lawson, J. T., Richmond, G. B., Stitt, H., Steele, A. C., Thompson, H. A., Tucker, T. S.

Materia Medica only.—Woodbury, K. F.

Pathology and Bacteriology.—Alyoe, H. R., Beir, E. R., Eaid, B. E., Fraser, W. R., Grant, C. L., Garvin, F. G., Hurst, A. R., James, H., McLellan, T. F., Lawson, F. J., Richmond, G. B., Stitt, H., Steele, A. C., Sproul, G. A., Thompson, H. A., Tucker, T. S.

Orthodontia.—Baird, W. F., Hurst, A. R., McLellan, T. F., McCarten, T. G., Leggo, A. R., Lawson, F. S., Stitt, H., Stewart, J. A., Schwalm, H. V., Sproul, G. A., Thompson, H. A., Tucker, T. S., Wright, F. J., Woodbury, K. F.

Prosthetic Dentistry and Metallurgy—Paper.—Hurst, A. R., McLellan, T. F., McCarten, T. G., Leggo, A. R., Law-

son, F. J., Stitt, H., Stewart, J. A., Schwalm, H. V., Thompson, H. A., Tucker, T. S., Trelford, W. G., Wright, F. J., Woodbury, K. F.

Operative Dentistry—Paper.—Hurst, A. R., McLellan, T. F., McCarten, T. G., Leggo, A. R., Lawson, F. J., Stitt, H., Stewart, J. A., Schwalm, H. V., Thompson, H. A., Tucker, T. S., Trelford, W. G., Wright, T. J., Woodbury, K. F.

Therapeutics only.—McCarten, T. G., Stewart, J. A.

Annual Meeting Nova Scotia Dental Association

Reported by GEO. K. THOMSON, D.D.S., HALIFAX.

THE annual meeting of the Nova Scotia Dental Association was held in Truro on July 15th and 16th, 1915.

The President, Dr. A. W. Faulkner, in a very interesting address, emphasized the necessity of stricter enforcement of the law with regard to illegal practitioners, and the resulting discussion was quite illuminating to those present.

A resolution to contribute \$50 to the funds of the Red Cross Society was unanimously passed.

The members were guests of the Truro Golf Club on Friday afternoon and the Canadian Club on Thursday evening.

A visit to the Doctors Pedigreed Silver Fox Farm proved very interesting and was much enjoyed by those who could attend.

The officers elected for 1915-16 were:

President—A. D. Hopper, Truro.

1st Vice-President—H. L. Daniels, Truro.

2nd Vice-President—F. F. McLellan, Westville.

Secretary—S. G. Ritchie, Halifax.

Executive Committee—R. H. Woodbury, Halifax.

A resolution was passed to postpone the joint meeting with N. B. and P. E. I. arranged for 1916, so that members would be better able to attend the C. D. A. meeting in Montreal next year.

Nashua, N.H.

Dr. Guy E. Flagg gave an illustrated lecture on "Oral Hygiene" before the Mothers' Club at the May meeting.

Officers Nova Scotia Dental Board

AT the annual meeting of the Nova Scotia Dental Board, held in Truro, N.S., July 15th, the following officers were elected:

President—Dr. F. W. Ryan, Halifax.

Secretary Registrar—Dr. Geo. K. Thomson, Halifax.

Treasurer—Dr. A. W. Cogswell, Halifax.

Executive Committee—Halifax members of the Board.

An Appeal from Valcartier Camp for Services of Civilian Dentists

AN appeal has been made by Captain Edmund A. Grant, C.A.D.C., in charge of dental services Valcartier Camp, for dentists to volunteer their services to assist in the dental work required at Valcartier Camp. The following letter addressed to the editor by Captain Grant is self-explanatory:

Sir,—Believing that you are interested in the army dental work, am taking the liberty of asking your co-operation in regard to securing civilian dentists to assist us in the work at Valcartier Camp. We have a Dental Hospital of five chairs with three officers of the Canadian Army Dental Corps detailed for duty. Am expected to man the other two chairs by voluntary efforts of the profession, as I am informed that the profession has officially intimated to the militia authorities its desire to participate in this work.

If you know of any dentists who would volunteer their services for a short period, would be greatly obliged if you would ask them to communicate with me. Transportation would be allowed. Also there is an allowance of \$3.00 per day for subsistence.

We have very comfortable quarters here. The camp is in a beautiful situation, and we will do everything we can to make their visit interesting and enjoyable.

Would greatly appreciate your efforts in this connection.

I have the honor to be, sir,

Your obedient servant,

EDMUND A. GRANT, Capt., C.A.D.C.

Dental Infirmaries and Public Health

ASSISTANT Surgeon-General W. C. Rucker of the Public Health Service, recently referred to the Forsyth Institute as one of the most advanced organizations in the country. Dr. Rucker mentioned some very interesting facts regarding the importance and conduct of the institute and stated that it takes a generation for a new public movement to begin to bear fruit. For instance, it is practically out of the question to persuade the adult population of Boston to change its ways materially. But it is possible to teach the children, and this is exactly what the Forsyth Dental Infirmary proposes to do. The boys and girls of the modern Athens, from this time on, will grow up with clean mouths, and with the habit of keeping them so. Even the poorest children will acquire the habit of the toothbrush, which, barring only the fork, is the greatest sanitary instrument ever devised by man.

Modern civilization recognizes the child as the most important asset the community possesses. But the child's value as an asset depends on its health. Neglect in this matter may convert the asset into a liability.

Until recently the interest of the community in the child has centred upon its mind. Now for the first time its body is beginning to be seriously considered. Physical examination of school children is required, and when they are found defective it is customary to refer the case to the hospitals or to the family physician.

Defects of one kind or another were found in nearly seven out of every ten Boston children examined. Of such defects 84 per cent. were of the mouth, troubles of teeth, adnoids, swollen tonsils, defective palates, etc. But, strange to say, for such troubles as these there has been hitherto little provision for treatment in any of our cities. The great institution in Boston represents the first attempt on an adequate scale to meet this requirement.

During the next few years much of the work of the Forsyth Dental Infirmary will consist in the extraction of hopeless teeth and the curing of mouth troubles already established through neglect. But as time goes on the treatment given will be in a steadily increasing measure preventive in character. The patients will be taken in hand very early in life and their mouths will not be allowed to get out of

order. Under the system now adopted the case of each child treated is followed up by a series of appointments if necessary, until the mouth, nose, and throat are clean and healthy.

So much I have said about the Boston institution because of its value as an object lesson for other municipalities. Its completeness may be judged from the fact that one wing of the magnificent building is devoted to tooth extracting and anesthesia cases, with separate wards for boys and girls—each ward being provided with three beds for patients who have undergone major operations.

Adjoining the wards is a diet kitchen. A special exit is provided for patients who have their teeth extracted or who suffer other painful operations, in order that children recovering from nervous shock or the effects of ether may not come into contact with those awaiting treatment.

Experience has taught that to children the process of waiting, while compelled to sit primly on benches, is more exhausting than actual dental work. Accordingly, they are allowed to play about in a park that adjoins the waiting room, and thence are summoned, in small squads, to be inspected and assigned to different departments according to their needs.

The Forsyth Infirmary starts with sixty-four chairs for patients.

Washington, D.C.

The Dental Clinic which has been conducted at Pierce School since last November has been closed during the summer. This clinic has been conducted by the National Capitol Dental Association in the hope of proving to the authorities the urgent need of free dental clinics. The attitude of the community toward the clinic is expressed in the following resolution, adopted unanimously by the Federation of Citizen's Associations, that "We do not feel that the expense of such an institution, now being operated and supported by a few public-spirited dentists at personal sacrifice of time and money, should be allowed or be necessary in this, the great capital of the nation, in view of the fact that many other cities throughout the Union have had for a number of years past well equipped dental clinics for the efficient care of the teeth of the children of the public schools, supported and controlled by their municipal governments."

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

MOUTH WASH TO BE EMPLOYED IN SCARLET FEVER.—For purposes of oral antisepsis in scarlatina, the following mouth wash is recommended: Phenyl salicylate, 2 gram; boric acid, 10 gram; alcohol, 40 gram; aqua, 500 gram.—*Serestre, Nouveaux Remèdes, per N. Y. Med. Journal (Dental Cosmos).*

THE ROACH ATTACHMENT.—Of the various forms of manufactured attachments I believe the ball and tube form—the “Roach attachment” to be the best. There is no form of attachment in use to-day that has the numerous advantages that has this attachment, and yet many men have failed because they seemingly did not know how to use it. The ball should be soldered to the crown or inlay—do not cast onto it. The small end of the shank of the ball part should either be cut off or a hole drilled into the crown or inlay to allow this constricted part to go entirely into the crown or inlay and then be securely soldered to place as near the gingival as is consistent with the soft tissues—usually somewhat lingually of the centre on the mesial or distal surface—it should never project lingually. The tube must always be soldered to its support, use 18k solder; never cast onto it. Clasp metal wire or plate is best for this purpose, which may project into the vulcanite or be soldered to a metal base.—*G. W. Dittmar, D.D.S., Chicago, Ill. (Dental Review.)*

STATISTICS CONCERNING NUMBER OF ROOT CANALS IN MOLARS.—According to J. Lacroix, the upper first molar has three root canals in 54 per cent., four root canals in 46 per cent. of cases; the upper second molar three root canals in 78 per cent.; four canals in 12 per cent. of cases. The lower first molar has three canals in 75 per cent., four canals in 15 per cent. of cases; the lower second molar three canals in 62 per cent., two canals in 28 per cent., four canals in 5 per

cent. of cases.—*J. Filderman, Journ. Odontologique de France (Dental Cosmos).*

BAD TEETH A CAUSE OF CANCER.—Constant irritation of any part of the body is now well recognized as an important contributory cause of cancer. One of the forms of irritation which has been repeatedly observed to result in this disease is the constant friction of the sharp edges of bad teeth or of imperfect plates against the sides of the tongue. To be sure, sores on the tongue caused in this way do not always become cancers. Neither are wounds from toy pistols always followed by lock-jaw. But there is danger in both cases, and it is as easy to avoid it in the one as in the other. A bad tooth should never be tolerated in any event, and the danger of cancer is only one more good reason for having it attended to. Cancer of the tongue may occur at any age, but it is most common between 40 and 60. Statistics show very few cases under thirty. The majority of these cases occurred in females, while in later years males were found to be more frequently attacked. Cancer of the tongue in young subjects is especially fatal. Out of thirty cases there were only two recoveries. The others died within ten months or could not be traced. As one-third of all the cases investigated have been shown to be definitely associated with jagged or decayed teeth or imperfect plates, it would seem that here, at least, is one method of preventing cancer. It is probable that other conditions occurring in combination with the bad teeth increase the likelihood of cancer of the tongue as a result, but the removal of this form of irritation is so simple a matter that deaths in cases of this kind must be mostly charged to pure neglect. Where a sore place caused by a jagged tooth does not promptly heal there is real danger of cancer. If the removal or treatment of the tooth does not relieve the situation and the ulcer continues, prompt operation is necessary, for this form of cancer is quickly fatal.—*Journal of the American Medical Assoc. (Dental Summary).*

PRACTICAL METHOD OF USING OIL OF CAJUPUT.—Many practitioners use oil of cajuput or some other essential oil for smoothing off the wax model for an inlay before removing it from the cavity. To prevent excess and spilling the contents of the bottle, a small medicine bottle is filled with absorbent cotton. The oil is poured on this cotton until the latter is slightly saturated. When the pellet of cotton to be used is touched against the oily cotton in the bottle, it will not become over-saturated.—*F. S. Dilger, Dental Review.*

ORAL HEALTH

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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. 5

TORONTO, SEPTEMBER, 1915

No. 9

EDITORIAL

Dental College Enrollment

THE time has again arrived when members of the dental profession have the privilege of directing the attention of worthy young men contemplating a college course, to the practice of dentistry as a life work.

There is a direct relationship between the maintenance of dental standards and an adequate supply of dentists to properly meet the public demand for dental services. And it is clearly the duty of the dental profession to both meet the public demand for dentists and maintain the highest standards of preliminary and professional education.

A student entering a Canadian Dental College this year will not graduate before the spring of 1919. What will be the demand in Canada for dentists four years hence? The indications are that conditions in 1919 will be of such a character that unusual demands will be made upon the dental profession. Consequently the profession cannot afford

to have fewer Freshmen enrolled in the Canadian Dental Colleges this year than have been enrolled heretofore.

Of those who are adapted to the practice of dentistry only the brightest and best should be encouraged to enter. The character of the dentistry of to-morrow is in the hands of the dentist of to-day.

The Canadian Army Dental Corps

THE greatest credit is due the Canadian Army Dental Corps for the efficient dental organization which has so rapidly been established for the care of the dental needs of the Canadian soldier, whether Overseas or in the Mobilization Camps. The latest advance step is the decision to extend the dental work at Mobilization Camps beyond the sphere of operative dentistry and place at the disposal of the army, the services of dental prosthetists.

All dental work will of course be done without expense to the soldier and will remove any disability of a dental nature which may have heretofore interfered somewhat with recruiting.

The recent army order permitting the recruiting of volunteers with full or partial dentures made it absolutely necessary to enlarge the character of dental work undertaken. The result has been to greatly increase the responsibilities of the army dental surgeons in charge of these camps. Elsewhere in this issue Captain Grant of the Valcartier Camp makes an appeal for assistance to civilian dentists. A similar appeal was made some time ago by Captain Hume of Niagara Camp. Many members of the profession who cannot go to the front will, no doubt, be glad to avail themselves of this opportunity to "do their bit."

Dr. G. V. Black, Deceased

IT is with deepest feelings of sorrow and regret that we learn, while this issue is yet in press, of the demise of Doctor G. V. Black, Dean of the Dental Department, Northwestern University, Chicago.

The late Dr. Black was one of the noblemen of dentistry. He endeared himself to the dental profession the world over, because of his life-long service for the advance-

ment of dentistry. Word of his death, following so closely upon that of the late Dr. J. B. Willmott, will come to Canadian dentists with particular force.

The older leaders of dentistry, who have been so largely instrumental in raising and maintaining the status of the dental profession are "passing over" one by one, and the question that comes to most of us at such a time as this relates to our own individual worthiness of the self-sacrificing devotion of those who have labored for the uplift of dentistry and its scientific practice. Have we paid back, in service to the profession, what we have received from such men as Black and Willmott? If every dentist fully realized the debt he owed, and undertook to pay that debt in personal service to his profession, what a tremendous stimulus the dental profession would receive.

The School Nurse

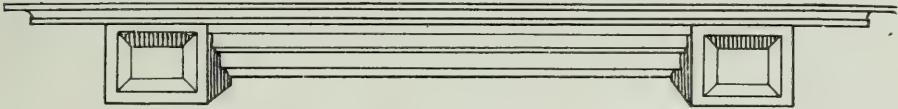
DENTAL and medical inspection in schools without an effective "follow-up" service is ineffective. The "follow-up" in such work is the visiting nurse. That the visiting nurse is a good economic investment is evidenced by the fact that some of the larger insurance companies find it to their advantage to employ a number of nurses to visit homes of policyholders.

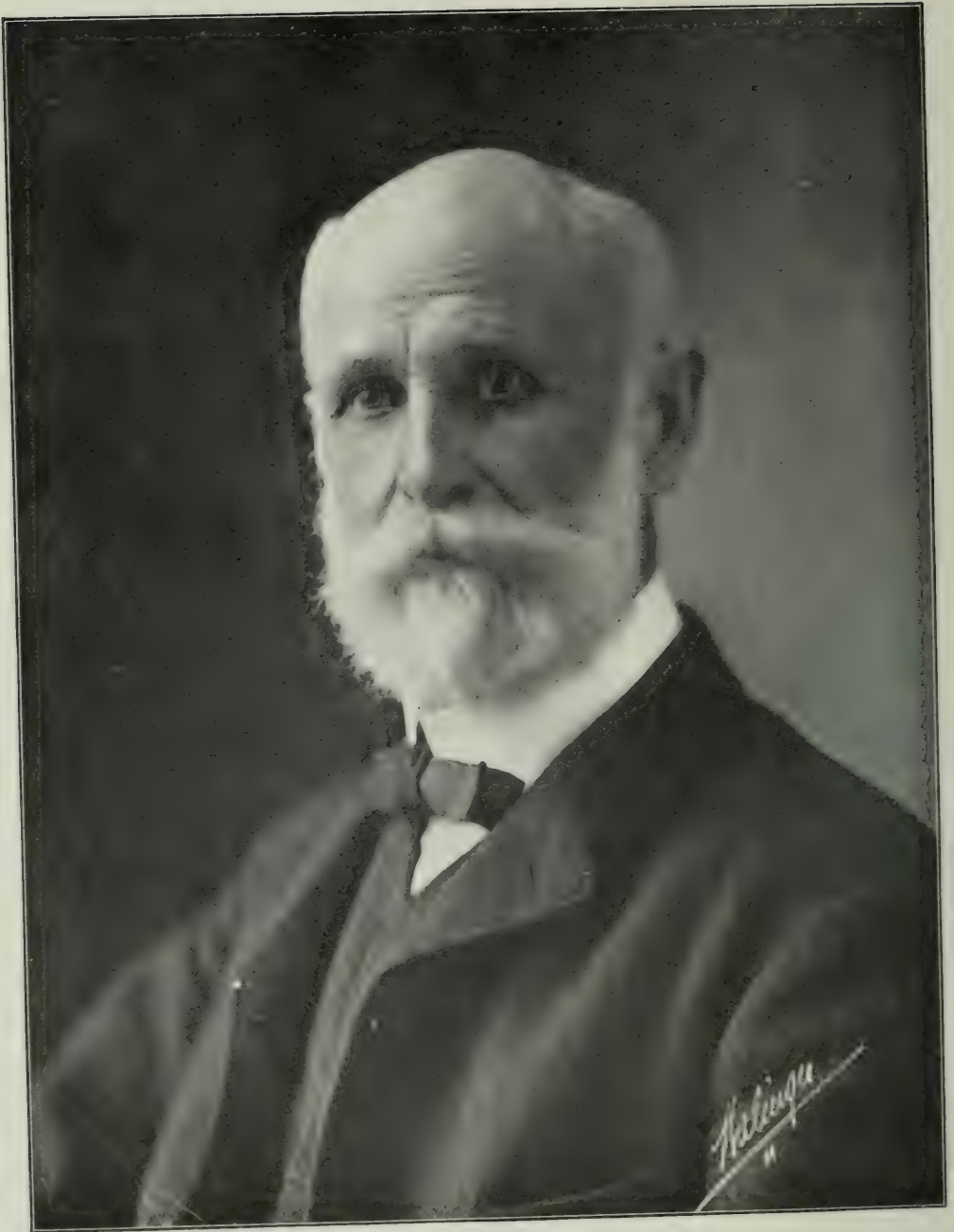
Effective work in oral hygiene can only be accomplished through co-operation between the school and home. Meetings of Women's Institutes or Mother's Clubs is an excellent opportunity that should never be neglected for presenting oral hygiene instruction and is a valuable aid in securing active co-operation in the home.

Mrs. O. K. Gibson, Deceased

IT is with deep regret that we record the death of the wife of Major O. K. Gibson, C.A.D.C., Overseas. Upon learning of the serious character of Mrs. Gibson's illness, Major Gibson sailed for home on August 25th, but the end came while he was in mid-ocean. A baby girl about a year old adds to the tragedy of the bereavement. The Ottawa confreres and friends of Major Gibson unite with the entire dental profession in extending the kindest feelings of sympathy to Major Gibson and other members of the family.

IF a young man is prepared to drop all efforts to improve his education after he has left college he has no chance nowadays to make a success in life. Even fifty years ago it was customary for a young man after entering on a career to give up his spare hours to study and to attending lectures on various subjects that would enable him to make his mark later in life. I do not suggest doing away entirely with sports and games and sufficient physical exercise and amusement, but if he desires to take every advantage of his opportunities and to succeed in life he should have no hesitation in sacrificing some portion of his spare time to complete or rather add to his educational advantages.—**D. R. Wilkie.**





The Late Dr. Green Vardiman Black

*Dean Dental Department,
Northwestern University, Chicago*

*Died August 30th, 1915, at home of his boyhood,
Jacksonville, Illinois*

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 5

TORONTO, OCTOBER, 1915

No. 10

*Oral Manifestations of Constitutional and Infectious Disease**

BY J. GARNETT NELSON, M.D.,

Professor Physical Diagnosis, Medical College of Virginia.

IN the consideration of this subject, it is necessary for us not to confine ourselves to the teeth and gums, but to think of the entire oral mucous membrane, tongue, tonsils and pharynx as well. Also, we must look at the subject from two angles: First, the constitutional or infectious diseases that cause changes in the mouth or pharynx, and, secondly, changes in the mouth or pharynx that cause trouble elsewhere. In other words, when a patient comes to a dentist the possibility of there being serious need of an internist or surgeon should always be borne in mind, just as when a patient comes to an internist the assistance of a dentist may be absolutely indispensable. The relations of cause and effect are so close that closer relations between the professions should be fostered. The day has long since past when a dentist's duties were confined to pulling, plugging and straightening teeth, or stopping aches. This fact the dental profession was first to recognize, as evidenced by the increased number of so-called medical subjects included in the curricula of dental schools and the efforts on the part of some to require all students of dentistry to first become graduates in medicine.

The eye of the dentist must be the trained eye of the diagnostitian. He must carefully look at the throat and

*Read before Richmond Dental Society, 27th Sept. 1915.

mouth of his patient, and be prepared to grasp a comprehensive view of the whole organism. He is a sentinel whose eternal vigilance and frequent opportunity should enable him to recognize all oral symptoms or signs of acute or chronic disease, and himself relieve them or refer his patient to the proper assistant.

Systematically considering this whole subject leads us into so many byways that we must confine ourselves to more or less cursory views and not go into detail as thoroughly as might be desirable. The whole field may be divided into two classes:

1st. Conditions of which the patient is likely to be already conscious.

2nd. Conditions of which the patient may be ignorant, and which the accidental inspection of the dentist must detect.

This latter is obviously the more important of the two, and alone invites our attention.

It is impossible and unnecessary to do anything more than mention certain affections, such as acute pharyngitis, ulcers of the pharynx, tonsillitis, ulcers of the cheek, or tongue, painful syphilitic and tubercular sores, spongy gums, syphilitic teeth, salivation, etc.

Do there remain, then, any appearance of these various structures which should be noted in order to put our patient on the road to whatever relief may be possible? Beginning from behind and working forward, we consider them briefly in order.

THE PHARYNX AND SOFT PALATE.

The accidental discovery of disease by the appearance of the pharynx or palate is extremely rare. Probably the most frequent latent condition of either is syphilis. In the pharynx rounded, yellow, sloughing, painless syphilitic sores may be found; and perforations, adhesions or similar sores on the palate. Tubercular ulcers of the pharynx or palate are usually quite painful.

THE TONSILS.

Deep painless ulcers usually mean syphilis. Tuberculous ulcers may be similar, but they are usually very tender. Small miliary tubercles may be painless and first discovered by the observing dentist. Mention of the infected tonsil will be made a little further on when the infections are considered separately.

THE MUCOUS MEMBRANE OF THE MOUTH.

Here the most important things to bear in mind are the

so-called Koplik's spots in measles, and the syphilitic mucous patch.

THE TONGUE.

A coated tongue does not bear the significance commonly attributed to it, and is not of near the diagnostic value as the opposite condition, i.e., the smooth, slick red tongue of chronic gastritis.

The tremor of the alcoholic's tongue is also interesting.

THE GUMS.

The so-called lead line may be discovered. This is not truly a line, but a series of gray or black dots near the margins of the gums. Where there are no teeth, there are no dots. The spongy gums of the patient suffering with scurvy or mercurial salivation are rarely discovered accidentally.

Painful or tender gums, if strictly localized, may be of neuralgic origin, or, of course, due to decayed or infected teeth, or the infection of a neighboring sinus or bone. If these conditions of the gums are more general, they are far more apt to be due to some constitutional condition, such as the gouty diathesis, whatever this may be, or some chronic nutritional or digestive disturbance. The exact relation of cause and effect has not been worked out, but it is clear to any physician or dentist, even of limited experience, that they dovetail into each other to a marked extent.

The existence of a vicious circle is self-evident. Painful or tender gums, or even receding gums, occur more frequently among the poorly nourished or anaemic; and conversely the improper mastication of food leads to chronic disease, especially of the digestive apparatus, and secondarily, therefore, of the kidneys and arteries.

THE LIPS.

Pallor of the mucous membrane of the lips suggests anaemia, while cyanosis suggests heart disease, lung diseases or poisoning by the coal-tar products. The parted lips of the patient with adenoids add to his more or less characteristic appearance. White linear scars radiating from the corners of the mouth are presumptive evidence of congenital syphilis. Syphilitic mucous patches may be discovered accidentally, as may also a small epithelioma or chancre.

THE BREATH.

Foul breath, except when due to dirty teeth and gums, is most often due to some condition of which the patient is aware, as stomatitis, tonsillitis, etc. At times it seems to be a family characteristic, or at any rate it is common to practically all of the members of the family in whom there may be no other evidence of disease. However, an ammoniacal

breath may be the only evidence of uraemia, as may the acetone breath, resembling rotting apples, be the only evidence of diabetes.

THE TEETH.

Exactly to what extent frail, fragile teeth, or teeth so soft that frequent attention is necessary, are related to constitutional disease is not known. It seems undoubtedly true, however, that there is a very definite relation between the latter condition, that is, the teeth that frequently need attention and nutritional or constitutional disorders, or abnormal conditions of metabolism. Certain alterations in metabolic processes, as in diabetes, chronic nephritis, chronic intestinal disorders, and especially the pregnant state, seem to be contributory factors in rapidly decaying teeth. We have all, of course, observed the frequency with which women in the last weeks of pregnancy, especially, suffer with aching teeth, or abscesses. The only reasonable explanation of this lies in the belief that on account of their peculiar state certain chemical or metabolic changes are going on, which we have no means at present of discovering, but which clearly make them liable to these decaying processes, and diminish their resistance to infections. Accepting this definite relation, we go but one step further when we believe that in all, or practically all, cases of rapidly decaying teeth, or frequent abscesses, or possibly pyorrhoea, disease or altered function of some important organ or organs is to a great extent responsible.

Thinking along this line, I again invite your attention to the pallid membranes of anaemia and the cyanosis of heart or lung disease. In all cases, therefore, of rapidly decaying teeth, or frequent abscesses, or pyorrhoea, the dentist should refer his patient to the family physician, with the idea that some chronic disease of the heart, lungs, liver, kidneys, or digestive tract is quite likely, or, I might say, almost sure to be discovered. There are undoubtedly numbers of these cases whose only hope of an early diagnosis lies in the thoughtful watchfulness of the dentist, just as in incipient tubercular infections, or beginning kidney disease, for example, an early diagnosis depends on the careful routine work of a physician, or is accidentally made by an insurance examiner. The patient himself, or applicant for insurance, may be entirely unaware of the existence of any serious trouble.

THE INFECTIONS.

Allusion has already been made to the manifestations of latent syphilitic or tubercular disease; the infected tonsil;

and the Koplik spot, as possibly the only sign of measles. The mouth of the pellagrin is fairly characteristic, but not commonly the only manifestation. A deep red blush spreading over the anterior pillars, the soft palate and the roof of the mouth, with numerous small bright red elevated spots is strongly suggestive. This condition is not necessarily accompanied by soreness, and may be discovered accidentally. Of course, we are all familiar with the oral conditions seen later in pellagra.

The question of focal infections has received a great deal of attention during the past few years especially. The papers of Billings in the Journal of the American Medical Association of September 12, 1914, and that of Rosenow of the same issue, give additional clinical and experimental evidence of the interdependence between focal infections and various general abnormal conditions. Billings states that the usual site of these infections is somewhere about the head, mentioning especially *alveolar abscess*, deep latent tonsillar or peritonsillar abscess, sinusitis, pyorrhoea, etc. The presence of these infectious foci result directly in joint disease, neuritis, swollen tender muscles, endocarditis, ulcer of the stomach or duodenum, cholecystitis, thyroiditis, pancreatitis, etc. Thayer, discussing Rosenow's paper, says: "There has been no one circumstance in the last fifteen years that has so changed the aspect of the practice of medicine as the recognition of the influence of local foci of infection on the production and course of a variety of general processes of previously uncertain etiology; the proportion of cases of valvular disease of uncertain origin that show old chronic affections of sinuses, of teeth, especially of the tonsils, is very large."

Rochester reports three cases of endocarditis in which there were no manifest symptoms in the mouth, but in which the Roentgen Ray showed abscesses of the *roots of several teeth*, adding that when the abscesses were relieved the symptoms subsided and the patients improved clinically.

So then we may believe it to be permanently established that the ills for which infectious processes about the mouth may be responsible are legion.

In conclusion I wish, especially, to emphasize the converse of this as being a line of thought of certainly equal importance. A swollen, inflamed ankle may be due to an alveolar abscess and is not going to get well until the abscess is relieved. On the contrary, frequent abscesses and pyorrhoea are seen so often among the previously unhealthy that we cannot believe that relieving one or more local foci,

or treating pyorrhoea as a local condition, without a careful attention to circulatory, digestive, or nutritional disturbances, is anything but bad practice.

Relieving Pain by Pressure

IF you had toothache would you think of relieving it by squeezing your toe? Nevertheless, toothache can be cured in that way. At least so declares Dr. William H. Fitzgerald, an American physician, who contends that pain in any part of the body can be cured by pressure in some other part of the anatomy. His "push-button" theory has created some opposition, but more amusement among medical men. It is interesting to read what Edwin F. Bowers has to say on the subject in *Everybody's Magazine*:

It is a good deal to ask even a layman to believe that pressing the first joint of his toe will make a cuspid tooth stop aching, and this is one of the most familiar of the doctor's feats of medical legerdemain. Dr. Fitzgerald claims that simply by pressing a definite focal point in the particular zone affected, pain can be relieved in any part of the body where there is not present an active inflammatory condition.

Dr. Fitzgerald doesn't advance any theories explaining his discoveries. He says he didn't start out with any hypothesis. Accident disclosed that pressure on a certain spot in the nostril gave practically the same result as the use of cocain. That was six years ago. He began experimenting, and found there were many spots in the nose, mouth, throat, and on the tongue which, when pressed firmly, deadened certain areas to all sensation.

He began using nerve-pressure instead of local anaesthetics in his operations, and now rarely has any use for cocain. He has charted upward of three hundred foci in the cavities of the nose and throat, including the mouth and tongue.

It is claimed that nerve-pressure will completely obliterate pain in about sixty-five per cent. of the cases, while it will deaden pain in about eighty per cent.

In the hands of those who have tried nerve-pressure the percentage often is much lower. The foci are no larger than the head of a match. If the operator doesn't hit them he misses them completely, and also misses results. They are like electric buttons. Pushing in the vicinity is utterly useless. The button has to be pressed.

Dr. Fitzgerald claims that anything which tends to relieve pain also tends to remove its cause. The assertion that pressure on the great toe could cure toothache becomes commonplace compared with the statement that this same pressure would relieve bronchitis.

After going into the methods by which the "push-button" method is applied to cure hay fever and goitre, the writer proceeds to explain how it is done. He says:

The Hartford physician divides the body into ten perpendicular zones, including the line running up the middle of the body, and these zones correspond to the fingers of the hand, or the toes. One using his method must know what hand or foot to press, and how, in order to get a definite desired result.

If the first joint of the thumb is pressed firmly and steadily for three minutes, it will relieve and favorably influence pain in the stomach, the chest, the front teeth, the nose, the great toe, as well as everything else in this zone. But it will have not the slightest influence upon the tonsils, the liver, or the spleen, for they are in the fourth zone, and to affect them it is necessary to make pressure upon the fourth finger. Furthermore, pressure on the right hand will not have any effect on the left half of the body.

It makes a difference, too, whether the upper and lower or the side surfaces of the joint are pressed.

In the pursuit of his own specialty Dr. Fitzgerald found that the teeth played a highly important part, as decay in them evilly affected the throat, particularly the tonsils, and had an especially vicious effect upon goitre. He declares he never has seen a case of goitre in which there was not something wrong with the teeth. So he insisted that his patients seek a dentist. This led to experimenting with nerve-pressure in connection with dentistry.

There are about twenty dentists in Hartford who use the Fitzgerald method in their daily practice in preference to any other anaesthetic. Its particular value is as an analgesic in preparing cavities to be filled.

Dr. B. A. Sears, of Hartford, is reported to have used nerve-pressure anaesthesia in more than three hundred cases of extraction with wholly satisfactory results. He has employed this in the operation of removing impacted molars.

The best results are obtained through the use of a probe directly upon the nerve where it exists from the jaw bone. The blunt end of an excavator makes a capital probe. Many operators prefer to make pressure with thumb and finger

over the root of the tooth operated upon. Start gently, increasing the pressure, and holding steadily for three minutes. Maybe the thumb and finger will ache more than the tooth. If the nerve is not exposed and there is no abscess at the root of the tooth, this pressure will, it is claimed, stop the aching.

The dentists who use the nerve-pressure method find the application of the pressure to the fingers efficacious to excavating, filling, and scaling deposits, according to Mr. Bowers. Pressure on either thumb will, it is said, keep the front teeth and the canines quiet; the first finger controls the bicuspid; while the middle finger will make the molars behave despite the dentist's direct efforts, although the third finger may be called in to help. The little finger doesn't do much work, for it bears only upon the wisdom teeth.

The patient may apply the pressure himself, but the operator or his assistant can do it better. It may be applied to both top and bottom and sides of the first joint of the thumb and finger. Pressure should be just short of pain. Usually the patient says that his fingers feel numb, and this numbness gradually extends through the arm and over the body in that particular zone.

Post-Graduate Course in Prosthetics

IN spite of adverse conditions prevailing a group of men, confident of the future of dentistry, and numbering sixteen, presented themselves at the Royal College of Dental Surgeons on Monday, August 16th, for the purpose of enrolment in the two weeks class in Prosthetics organized by Dr. Cummer, of Toronto. Dr. J. H. Irwin, of Collingwood (ex-president Ontario Dental Society), Dr. J. H. Dohan (of the faculty of Dentistry, McGill University), Dr. W. J. Giles and Dr. W. E. Kennedy, all of Montreal; Drs. E. M. Doyle and H. G. Robb, both of Calgary; Dr. E. E. Hart of Sackville, N.S., Dr. F. A. McCullough of Troy, Ohio, U.S.A.; Dr. F. E. Warriner of Winnipeg, Man.; Drs. J. M. Cation, L. Gerald Smith, Toronto; Dr. O. S. Clappison, Hamilton; Dr. J. L. Anderson, Oakville; Dr. Herbert Irvine, Lindsay; Dr. M. McKay, Pembroke; and Dr. L. G. Mabee, of Goderich.

The work of the class consisted mainly, after listening to suitable lectures and demonstrations, in carrying out a practical case in the mouth, using the Greene-Suplee method slightly modified, constructing Spence's Plaster compound



Cummer Prosthetic Post-Graduate Class, 1915

Upper row standing (left to right): E. E. Hart, Sackville, N.S.; L. G. Mabee, Goderich, Ont.; M. McKay, Pembroke, Ont.; F. E. Warriner, Winnipeg, Man.; H. Irvine, Lindsay, Ont.; J. M. Cation, Toronto, Ont.; H. G. Robb, Calgary, Alta.; J. H. Irwin, Collingwood, Ont.; E. M. Doyle, Calgary, Alta. Second row, sitting: F. A. McCullough, Troy, Ohio, U.S.A.; W. J. Giles, Montreal, Que.; W. E. Cummer, Toronto, Ont.; J. H. Dohan, McGill University, Montreal, Que.; Geo. H. Wilson, Cleveland, O. Lower row: O. S. Clappison, Hamilton, Ont.; J. L. Anderson, Oakville, Ont.

casts upon which aluminum bases were cast by the indirect method and reswaged on the Ash press, the teeth being subsequently chosen and arranged after the methods of Williams and Gysi and mounted upon Gysi's latest articulator. Concurrent with this, the class witnessed clinics covering the newest developments in removable-bridge-partial-dentures, manipulation of various of the new materials, processes, etc., covering all that is new and approved in Prosthetic Dentistry. Some interesting tests on the behavior of various plasters were made on apparatus provided by various members of the class.

Dr. Geo. H. Wilson presented the various aspects of the subject of Plaster, Vulcanite, and the esthetic side of Prosthetic Dentistry in his illuminative manner, based upon exact knowledge and lengthy experience. His suggestions in the handling of the above mentioned materials were of greatest practical value to the class.

A comprehensive lecture on the fundamental subject of root canal fillings was delivered by Dean Webster. A particularly wide field was covered, including the systemic effects of septic foci in the mouth, roots which should and

should not be retained, various of the newer methods of root filling, with practical demonstrations with the aid of the lady assistant, resulting in one of the most interesting and profitable hours spent by the class.

Dr. Wallace Seccombe's series of lectures on the subject of Economics were quite practical and of greatest interest, covering, as they did, a particularly wide range of subjects for the short time at hand, including the general subject leading into the subject of Dental Economics, Methods of Handling Patients, Valuation of Service, Economic Production of Service, Office Accounting, and a number of other sub-heads. In this connection a number of city offices received visits from the class.

The fine set of models belonging to the prosthetic department of the Royal College Dental Surgeons was an object of continual interest and study on the part of the members. A pleasant feature of the class was an all-too-short visit from Dr. C. N. Johnson of Chicago.

The concensus of opinion among the members of the class pointed strongly toward appreciation and satisfaction in this form of "economic" holiday.

The Dentist in the Army

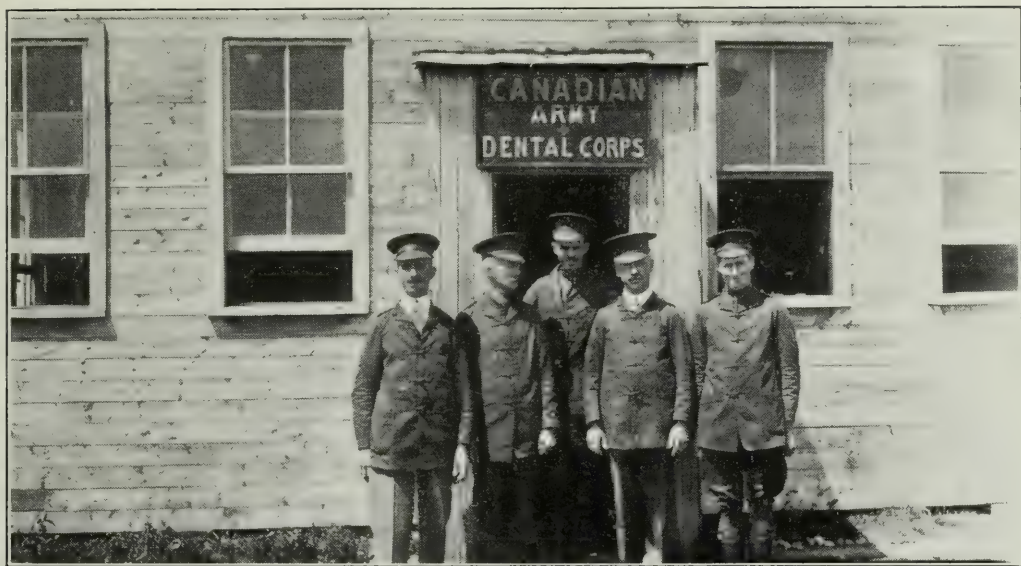
BY W. BERTRAND T. AMY, D.D.S.

THERE is a feeling of deep satisfaction—or should be—among the members of the dental profession, at the formation of the Canadian Army Dental Corps.

For years there has been considerable discontent in the profession over the status of the dentist in the army. As a part of the Army Medical Corps, the dentist received but an honorary title, without substantive rank, and yet when this war was declared there were more men rejected on account of defective teeth than for any other one cause.

Representations were made to different authorities as to ways and means of removing the cause of the rejection of so many otherwise physically fit men, keeping in mind also the necessity of having dentists in the army ready to render their services at the front or wherever it might be needed.

After many delays, permission was granted to establish a five chair clinic at the Exhibition Camp, Toronto, where part of the first contingent was quartered. The Government voted a small sum of money to cover expenses, and the dentists of Toronto volunteered their services. The good work



Reading from left to right: W. B. Amy, Lieutenant Sangster, Captain Grant, T. N. McGill, Lieutenant Hammill.

accomplished here convinced many, even of the skeptics, that the dentist had his place in the army. The Minister of Militia, who had been in sympathy with the movement from the beginning, ordered a new unit to be added to the army, to be known as the Canadian Army Dental Corps.

Doctor Armstrong—now Colonel Armstrong—was given orders to organize the new Corps somewhat on the basis of the Medical Corps. Dentists who had military training were supposed to have the preference for overseas.

Approximately fifty men accompanied the first contingent. Some are in England, others are in France, and still others are in the Dardanelles.

In Canada, clinics have been opened at the mobilization camps, where amalgam and cement fillings, prophylaxis and extracting have been authorized to be done free for all soldiers.

For some little time no prosthetic work was done, but within the past few weeks this too has been authorized, and an outfit added to the camps. Simultaneously with this last order, the enlistment regulations regarding defective teeth were cancelled.

The mobilization camps, with the dentists in charge of the Army Dental Corps work, are as follows:—

London—Two officers, two assistants. Capt. F. P. Shaw.

Niagara—Six officers, six assistants. Capt. G. Hume.

Barriefield—Three officers, 3 assistants. Capt. A. W. Winnett.

Valcartier—Seven officers, seven assistants. Capt. E. A. Grant.

Montreal—One officer, one assistant. Capt. F. M. Wells.

Quebec—One officer, one assistant. Lieut. A. Dubord.

Sewell, Manitoba—Four officers, four assistants. Capt. J. F. Morrison.

Vernon, B.C.—Two officers, two assistants. Capt. E. S. Tait.

Calgary—Four officers, four assistants. Capt. J. S. Wright.

Bermuda—One officer, one assistant. Capt. D. H. Hammill.

This is a total of thirty-two officers and thirty-two assistants.

As this article was being written many of the men here listed have received orders for immediate overseas service.

Unfortunately, the larger camps, Valcartier and Niagara, have not been fully manned with overseas men, so that volunteers have had to be brought from some of the cities. In some sections there has been considerable difficulty in getting men to fill the vacancies from nearby cities, Valcartier having to secure the most of her civilian dentists in Toronto.

Just to give the dental profession at large some idea of how one of these clinics is conducted, it may not be amiss for me to tell what I saw at Valcartier as one of the civilian dentists. The Army Dental Corps' quarters at Valcartier are especially well situated on high ground, commanding a very fine view of the surrounding country. The front half of the building, which has many windows, is used exclusively for Army Dental affairs, while the rear half is occupied as sleeping quarters by the Corps.

The equipment of the Army Dental Clinic is really wonderfully complete. While the chairs are not Columbias, they as a rule keep the soldiers off the floor at least. The chairs are accompanied by fountain cuspidors of ancient date, but still giving good service. Some of our cast-off foot engines, and an ample supply of new instruments, enable the Army dental surgeons to accomplish the results desired.

Each Army dental surgeon has an assistant who has had some past experience in some branch of dentistry. After each operation the instruments used are thoroughly sterilized in electric sterilizers, a man being in charge of this important part of the service. A generous supply of clean towels is always kept on hand, and the operating rooms are swept and scrubbed after each day's work.

To protect the Army dental surgeon as far as possible from the septic conditions that might be found in some of



Tooth brush drill, conducted by Dr. O. H. Zeigler.

the oral cavities, each body of men arriving at the dental quarters are assembled at the water facets and given a lesson on how and when to wash their teeth. In this way the operator works in a mouth as clean as water and tooth powder can make it.

The men, generally speaking, are exceedingly appreciative of the work done, and doubly so when they learn that they are benefiting thus free of charge.

A card system is used in keeping account of operations performed for each soldier, so that at the end of a week or month it is an easy matter to ascertain the amount of work that has been accomplished.

To give some idea of the amount of work done at these camps, I will publish the operations for part of July and August at Valcartier camp. In the 43 days, with an average of four men working, there were 1,280 extractions, 2,089 fillings, 121 cases of prophylaxis, and 418 treatments, a total of 3,908 operations.

The evolving of the regulations to govern this Corps will of necessity be slow, as only time will show its weaknesses and defects, so let us all, instead of spending our time in criticizing what has been, and is being done, render all the aid we can both in money and personal help.

Much condemnation has been indulged in because the Government has not been called upon to furnish all that is needed for the Army Dental Corps. Why should we ask all this of the Government? Have not the citizens given machine guns? Have not the physicians and citizens given their time and money to equip the hospitals, etc.? Then

why should not we be proud to give of our time and substance to uphold the credit of our profession and for the good of our country?

The Niagara Military Dental Clinic

BY C. ANGUS KENNEDY, D.D.S.

DURING the month of June, 1915, the Canadian Army Dental Corps sprang into being. Since that date dental clinics have been organized at the different Concentration Camps throughout the Dominion.

The clinic at Niagara-on-the-Lake Concentration Camp was opened on the 16th of June with Lieutenants Guy G. Hume (since promoted to Captain-in-charge), and W. A. Trelford. Later D. J. Bagshaw joined the Corps. From the first the civilian dentists were asked to participate in the work of assisting the Corps by staying a week in camp and helping the department to do the work.

The first civilian to offer his services was Dr. J. J. Teetzel, of the Barbadoes, British West Indies, who, on learning that volunteer work was to be done, immediately cabled Capt. Hume to hold open a position for him. Dr. Teetzel stayed through to the middle of September, doing his bit for the cause. The doctor has done a great deal for the Corps and the Army, and the dental profession owe Dr. Teetzel a debt of gratitude for the excellent help he has given.

The services performed at the Niagara Dental Clinic have been greatly appreciated by the military authorities. Col. Logie has taken a great interest in the work, and on the recent inspection tour of Major-General Sir Sam Hughes, the Minister of Militia visited the clinic and asked numerous questions concerning the work being done. Sir Sam was greatly pleased at the appearance of the clinic, and made the assertion that if Capt. Hume had not all he desired, to ask Col. Logie, and his desires would be satisfied.

The work accomplished by the Dental Corps at this camp has been very gratifying. From the 25th of June to the 20th of September, the following operations were completed:—

Extractions	5,140
Treatments	1,708
Fillings	4,272
Men finished	1,462
Local anaesthetics	4,933
General	26

Emergency	620
Patients seen	3,395
From September 6th to 20th:—	
Dentures	86
Impressions	101

On the 6th of September, the Dental Corps received authority to do denture work, and since then the mechanical department has been working at high tension.

The profession has answered very nobly to the call for assistance to help at the different clinics, and it should be considered a privilege and duty to help out in this noble work. Those who had the privilege of attending the Niagara and Valcartier Camps, speak very highly of the enjoyable week or two they spent there. This is a work which we all can participate in, and we should volunteer to help on the first invitation.

The Niagara Corps has been enlarged of late to six officers, the additions being R. C. H. Staples and J. H. Duff of Toronto, and W. A. Burns of St. Thomas.

The following are the dentists who, at the call of duty, have manned the civilian chairs at the Dental Clinic, Niagara Military Training Camp:—R. S. Woollett, C. H. Clarkson, W. M. Sivers, W. F. Roper, W. E. Lundy, A. A. Smith, A. W. Ellis, S. L. Frawley, W. J. Cooper, G. M. Phillips, G. B. Williams, G. B. Hardy, J. W. Barber, A. J. Edwards, H. P. McKenna, J. W. Laflamme, R. Gordon McLean, F. W. How, F. K. Davis, C. E. Pearson, F. C. Husband, R. D. Thornton, Arthur Phillips, J. F. McMahon, E. H. Campbell, E. L. Gausby, E. C. Cummer, I. H. Ante, W. J. Dolson, W. G. L. Spaulding, C. E. Brooks, W. A. Dalrymple, P. St. C. Smith, P. J. MacLachlan, C. G. Scott, T. H. Graham, J. W. Coram, T. W. Dawson, F. A. Sellery, F. C. Vanduzer, Harold Clark, Bruce Nicholls, and Connelly.

Buffalo Letter

BY HABEC.

THE INEVITABLE.

THE wheels of time roll ceaselessly and steadily on, levelling the high, the low, the rich, the poor, to one common plane. The ruler of men offers no greater resistance to its everlasting grind than the most humble person on earth. It is coming our way. It is getting nearer each day, and it is a blessing that we cannot see how close it has already approached. The little flower has been crushed to earth, but its perfume rises to permeate the air and leave its fragrance in the grateful nostril. And, like that little flower, each one should give the best that is within him for the benefit of others, so that he also may leave the God-given fragrance which rises about his memory and makes his loss a personal one to all who knew him for his real worth.

With the passing of the late Dean Willmot a well-rounded career is ended, but it is impossible to compute the good that will live to make his memory revered by the thousands of his profession who have had the great good fortune to come under his influence. He was the father of the dental profession of Ontario, and the value of his labor for its advancement is greater than will ever be accomplished by any single person of the future.

The grand opportunity knocked at his door, and he accepted its challenge. Who could have done better? The Royal College of Dental Surgery is the answer, and what man, great or small, could dream of having a grander memorial? It was well earned and worthily placed, and although the insatiable wheels of time have crushed him to earth, the fragrance of his memory shall ever rise to remind us all of the value of his life to his fellow-man.

THE NEW DEAN.

Yes; everybody expected that Dr. Webster would be the second dean. It was the logical and natural consequence. Long and faithful service is thereby duly rewarded, and the welfare of the institution is assured. There are times when congratulations are like some rules—they should work both ways. This instance is not the exception, and we are glad to congratulate Dr. Webster and the Royal College also. Success added to success is the wish we have for the new dean, and it surely will follow if he but emulate the splendid example before him.

JUST TO MAKE YOU ENVIOUS.

How the great, all-embracing heart of Habec goes out to his poor and down-trodden brothers on this glorious August morning of the present year. It is sad to be poor and honest and struggle from morn till night to uphold the credit of the dental depot by the drippings of your wrinkled brow. Why not yield to the call of the humming bird and the bumble bee in some far-away sequestered spot and put on a few gold crowns where they are not required or a few bridges or pyorrhoea abutments and thereby become crooked and rich? Then with your ill-gotten gains, a fish line and a pair of pink pajamas, hie away to the mountain fastnesses, where the merry chipmunk chips in and raises the ante. Thereby you will be following the commodious footsteps of Habec, unmindful of the glaring trail of deception you have left behind. Put a Maxim silencer on your two cylinder conscience, open the cut-out and be on your way.

Had you done thusly, you might even now have been sitting, like Habec, on a real cushion, in a real rowboat of green denomination, having been wafted by gentle zephyrs assisted by a paddle, to the shady and uncultured shore of a beautiful Adirondack lake, languidly listening to Polly Wog and Frog Spawn softly drooning to their young. On the opposite shore Old Glory proudly waves against the green background of pine and birch, marking the spot where glimpses of white tents are all but hidden by the dense growth. A bridge that shows white and glaring with cross bars that look like sharp and ugly teeth, forms the only disquieting element in the beautiful scene and perhaps its influence is as much due to the suggestion it carries as to the effect upon the otherwise sleeping conscience.

Camp life to the dentist is like oil of cloves to an exposed pulp. It soothes his irritated nerves, gives him a sense of infinite peace, restores his jaded brain and the balsam-laden air permeates every sluggish cell of his mal-nourished lungs. What cares he for cranky patients, dead beats and over-due bills! T'ell with the whole outfit: they can't get him there.

Now wander from the lake into the narrow inlet, so small that you almost need to pinch the boat to get it through, ramble along the tortuous stream, rowing, paddling or "poling," as conditions may demand, swinging to the right, then to the left, sheering rocks, dodging logs, through weeds and grass until of a sudden you pop into another hidden and unsuspected lake. Thus one might wander day after day for an indefinite time, each lake and stream vieing in beauty with all the others, with the mountains majestically raising

their verdure decked peaks like powerful sentinels over all. Did you say it is grand? No! it is glorious.

PUSH-BUTTON ANALGESIA.

Now, we are *really* scientific. All we have to do is to press the right button and Mr. Molar, Bicuspid or Incisor is put out of the race for a few minutes while we have dug out the sensitive cavity or torn away the palpitating nerve. Even wresting the offending tooth from its happy home may be done by this new method without causing the slightest discomfort to anything but a finger or a big toe. "Doctor, I must have my wisdom tooth drawn. Can you do it without pain?" Yes, madam, if you will kindly remove your shoe." "Did you understand me, doctor? I said I wished to have my tooth drawn—I didn't come prepared—." How embarrassing! But in the future ladies must take warning and be sure the stockings are intact when visiting the up-to-date dentist.

All this necessary precaution is on account of Zonetherapy, which is a marvelous new method whereby pressing hard for three minutes upon the first joint of the thumb, fingers or toes, the nerves of the teeth are desensitized. Dr. William H. Fitzgerald, of Hartford, Conn., is the instigator and blocks off the nervous system into ten regions and has discovered the keys to the various nerve combinations. Habec has heard of the work of Dr. Fitzgerald before he read an articles in September *Everybody's*, and is satisfied of the doctor's honesty and sincerity, otherwise he would not bring it to your attention. That the idea is worthy of investigation there is no doubt. The next thing is to put it to practical use and get the results.

We will quote a paragraph from the article referred to: "The dentists who use the nerve-pressure method find the application of the pressure to the fingers efficacious for excavating, filling and scaling deposits. Pressure on either thumb will keep the front teeth and the canines quiet; the first finger controls the bicuspid; while the middle finger will make the molars behave despite the dentist's direct efforts, although the third finger may be called in to help. The little finger doesn't do much work, for it bears only on the wisdom teeth." The patient or assistant may apply the pressure on the top, bottom or sides of the first joint of thumb or finger and is brought to a point just short of pain.

Dr. Fitzgerald has placed an added significance upon the value of the teeth, for he believes that they help to preserve the continuity of our various nerve zones. No doubt their vitality should be preserved and the roots kept healthy, as

the claim is made that they assist in the normal functioning of the entire zone chain. So if Zonetherapy doesn't work in your hands, just lay it to loss of one or more teeth and unhealthy roots. Habec has tried it out and finds that pinching the other fellow's finger for three straight minutes hard enough to paralyze the nerve of a tooth is no synicure, and therefore humbly offers a suggestion to the Hartford scientist that he invent an adequate pinching machine. The clothes pin principle might be efficient, and by applying such an apparatus on each of the thumbs, fingers and toes, the operator could have the time of his life poking about the mouth at will while the patient could enjoy the thought that she was the family washing hanging on the line, entirely free from pain.

Our profession will consider Dr. Fitzgerald its greatest benefactor if he will kindly pursue his scientific researches a little further and discover the push-button for the nerve that controls the patient's purse. It would indeed be a great boon to us if we could paralyze or even relieve the hypersensitive state of many of our patients in this respect and have it last until they were well on their way home.

Let us interest ourselves in this method and test it thoroughly, for, with the mental suggestion that must accompany its operation, some good may result and surely no harm can be done.

THE KODAK WAY.

This is not a picture; it is a reality. Who made it possible? Eastman, of Kodak fame. Did you know that when you purchased an Eastman Kodak you were helping to make possible the second greatest gift that has ever come to the dental profession? Well, you were: for Mr. Eastman recently presented to the City of Rochester, through the Rochester Dental Society, nearly a million and a quarter dollars for the erection and maintenance of the second greatest public dental dispensary in the world. This great gift comes as the reward of more than ten years of faithful work, self denial and great pecuniary loss to a coterie of determined dentists who, at great personal sacrifice, established the first free dental dispensaries of this country in the City of Rochester. It was a great night for the R. D. A. when they assembled in the auditorium of the Medical Association Building to formally receive and ratify the latest and most munificent offering for the benefit of humanity and for the advancement of dental science. Perhaps these men were not proud. Oh! no! Nothing like that! They were overflowing with thanksgiving and gratitude. They were too humble

to show pride; they were too happy to display the emotion they felt, and Habec assures you that it was one of the greatest privileges he has ever enjoyed to be present and join in rejoicing with them. If there ever was one time when we were prouder of our profession than another, it was then and there. Unselfish devotion and sterling principles have for once at least been duly rewarded, and we glory with them in their achievements.

The building will be admirably adapted to its purpose; plain, substantial and adequate for the needs of the city for many years to come. There will be about thirty chairs, large waiting rooms, a rest room and a play room. Mechanical, chemical, clinical and scientific research laboratories; a complete X-Ray equipment, a training school for dental nurses, in fact everything needed to make it up to the minute in every way.

A TALE WITHIN A TALE.

In Habec's recent outpourings of non-sensibilities, he eructated a small package of gurgles anent our mutual friend and respected brother, Dr. C. N. Johnson. Evidently it was not entirely displeasing to him, for he comes back at Habec with a remark about having "done me too much honor . . . and I will try and do better by reason of what you have said of me."

Facts are, we could not not do him too much honor, and surely we could not ask him to "do better"; just that he never does worse—that's all; in which case we can give him a first-class recommend to that faithful chairman of the everlasting board of censors, Saint Peter. Then the good doctor proceeds to put one over on Bill Belcher; he of sylph-like proportions,—ye Editor of ORAL HYGIENE. That did us much good. He says: "The intimation that you and Belcher are younger than I am disturbs me a bit. Good heavens, man! I am younger than both of you fellows put together. (He could be ninety-three, at that. Habec.) Now, there's Belcher. Why *he* was industriously drawing milk for a living away down among the Pucker-Huddle Folks ages before my grandparents emigrated from Rhode Island and the Pennsylvania Dutch region. I am a kid beside Belcher. Why Belcher is so old he cannot remember the day when he didn't edit a journal for the uplift of oral hygiene. This is his second or third incarnation, and in each of the previous ones he was a star editor. He's got used to it and it is easy for him as rolling off a log. Young! Oh, no, Belcher can't be accused of that any more. Only his heart—that will always remain young. As for yourself—have you

forgotten the number of years you have been writing Buffalo letters? The records are against you." Up goes both our hands with a plea of guilty, for Habec couldn't even make a guess at the length of time he has been rolling rotten rhetoric across the line without confiscation or duty. The long suffering of our Canadian friends is really sublime.

But we are glad to see one slipped to Bill Belcher, even though we had to get one ourselves. We have another on him too, but don't tell him we told you. Bill and several of the boys went to Washington not so long ago and passed the first night on a sleeper. The following night when the sandman came Little Willie's way and he began to prepare for his beauty slumbers, he couldn't find his "nightie." No need to attempt to picture to you the wild scenes that took place or to record the language. We respect you too much to repeat it. If you know Bill, a slight draft on the imagination will supply the rest. Everybody was accused and had to submit to an examination of their baggage, even to turning their pockets wrong side out. Finally the violence of the fit subsided and Bill was induced to continue the disrobing act. O! but it was funny. After peeling off several surface layers that belonged to his tailor, together with a number of unmentionables and etceteras, next to the periphery of his anatomy the cut little nightie innocently reposed. He had worn it all day long, and yet he avows he is not absent-minded. At any rate, he went to bed good-natured.

Selah:

He who knows much is silent:

He who knows little of many things, talks much.

(We make those to order in any size, shape or color.)

A Dental Course for Medical Students

BY A. D. A. MASON, D.D.S.

IT is imperative under present day conditions, and knowing as we do the intimate relation between the different organs of the body, that the physician practising general medicine should have a thorough grounding in the pathological conditions of the mouth. The physician heretofore has almost entirely neglected this part of the alimentary canal, with the result that he frequently fails to recognize these pathological conditions, even when they are most apparent. This is the result of lack of dental education for

the medical student. When one is aware that there are about twenty-five feet of alimentary canal, and that only a few inches of that tract are open to vision, it surely behooves the physician, when looking for causes of trouble, to be familiar with and realize the significance of pathological manifestations that may be present in those few superficial inches, thus saving endless trouble and annoyance.

There are many phases of this subject that should be taught and impressed on the medical student [not that the physician intends to practice dentistry any more than he would practice as an eye specialist without special training] that he may at least recognize pathological conditions and realize their relation to the general system. No medical man should ever be guilty of lancing an abscess of a lower molar on the outer surface of the face, nor should he continue blindly treating indigestion, when the cause may be found in infection from conditions of pyorrhoea in the mouth.

Some of the medical colleges are already giving attention to this matter. What should be taught? It depends altogether on the time allotted on the curriculum. If the hours are few, the subject must be passed over so superficially that it is indeed hard to make it interesting to the student or to impress him with its value and importance. Then again, if it is not compulsory for the student to attend lectures, and if no examination is set at the end of the course, he fails to realize the important part this knowledge will play in his work as a practitioner.

The following phases of the subject might be mentioned as essential to a course of this character. These headings should be developed as time may permit:—

1. The formation and time of eruption of the deciduous, and permanent teeth.
2. Real and so-called diseases of dentition.
3. The anatomy of the hard and soft tissues of the tooth and their relation to the surrounding tissues.
4. Caries.
5. Pulpitis and pericementitis.
6. Alveolar abscess, both blind and with sinus.
7. How and when to extract teeth and at what ages.
8. The use of the hypodermic about the mouth and drugs to use.
9. Fractures of the inferior and superior maxillae with their treatment, and how to differentiate from dislocation.
10. Pyorrhoea, its effects on systemic conditions and its treatment.

11. Oral prophylaxis.

This course would at least give a medical student an insight into the close relationship between dentistry and the general health of the patient and be of invaluable aid to him in his general practice and the diagnosis of systemic disturbances.

Correspondence

LETTER FROM THE FRONT.

CAPTAIN C. A. CORRIGAN TO DR. J. F. ROSS.

Dear Jack:

Belgium, August 26, 1915.

They say the streets of Hell are paved with good intentions. If so, one of them should surely be named after me. I did receive the cigarettes, and yet, grateful as I am to you, I could not make time to sit down and thank you, until your card reminded me of my negligence.

A strange thing happened yesterday. A parcel came from England, with tobacco for the boys, and when it was being distributed a package was handed to me. It was Old Chum and the label read, "The Toronto Daily News Tobacco Fund," sent by Dr. J. F. Ross, 2 College street. Odd, wasn't it, that I should get a package from one I know so well?

September 5, 1915.

I'm afraid I'm a hopeless correspondent, Jack—at the rate of a page in ten days, you'd get this about Christmas. We have had a lot of wet weather lately, which has made everything and everybody thoroughly miserable, but we all realize it is but a prelude to what we will have all winter. This afternoon it is fine and warm, and since Church Parade I have been taking a hand at cricket.

We sent to England for a couple of bats, made some wickets and have quite good fun, officers and men meeting on common ground. I am being continually impressed by the odd features of this campaign. Just a couple of miles away, on the other side of a small ridge, two lines of trenches from forty to two hundred yards apart, contain thousands of men watching every opportunity to kill each other. A mile or so back of that, the battalions. Reserves have concerts, football, cricket matches, horse shows, etc. I was at a concert the other night. Imagine altogether seven hundred men sitting on the side of a hill with the moonlight at the

bottom of the slope, a waggon with a piano on it, and a couple of torches to light up the platform. Some of the talent is quite good, and at regular intervals a line in song or recitation would be obliterated by the noise from big guns nearby. Things are very quiet for some unknown reason, but occasionally we have a little excitement to break the monotony.

Coming out of the trenches one night, two or three weeks ago, they nearly got two of us. Sent a dozen rifle bullets within a few feet of us. It did not take us long to roll into the ditch. I suppose you were all delighted to hear of the honors and promotion which Jim MacBrien had received. He certainly deserved them, as he has been doing excellent work. He is very well liked in the Division, both as a soldier and as a gentleman.

Some little time ago, I was holding a grooming competition in the Company, and he came up and acted as judge, afterwards staying for dinner with us. I was sorry I did not see Nell, when we were at Lark Hills, but every time I was in Salisbury, it was on business, and I usually had to hurry to connect with some train, or bus going back to camp. I have been very much pleased to see the way the Toronto dentists have been assisting in this game, not only at the Exhibition Grounds and Niagara, but in the C. A. D. C. I had dinner with Col. Armstrong and Adjut. Hughes at No. 2 F. A. recently—they were up here looking over the ground. There is certainly lots of work to be done for the boys here.

There is a good deal of criticism here of certain officers who, through pull, have been invalided home to Canada on very slight excuse. You have a number of them in Toronto at present. So the poor old Dean has gone. It will seem strange around the College at Conventions without him.

Well, Jack, I must close. They are waiting for me to go into Headquarters. Will try and write a more interesting letter soon. Mrs. C. is very well, has been visiting pretty much since I was over, and is now at a beautiful place on the coast of Wales, Amroth Castle. Returns to the hospital shortly. I hope Mrs. Ross, Douglas and yourself are all fine and fit and enjoyed a good holiday.

Kindest regards to Mr. Allen and all at No. 2 College.

Very sincerely,

C. A. CORRIGAN.

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

AFTER-RESULTS OF CARIES IN CHILDREN.—All sorts of results have been ascribed to caries of the teeth. Ten years ago an enquiry was made in Manchester to find the cause for urgent attention to carious teeth. Staffordshire followed the example. But the statistics prepared for Manchester proved to be contrary to what was expected, and consequently they were ignored. However, when the Staffordshire report came out it agreed with his, that so far as school children are concerned there was very little evidence that caries of the teeth did much harm. When children leave school and go to work the result is different. There is then usually a definite deterioration in their health, and this is more marked when their teeth are carious than when they are sound.—*Dr. A. B. Ritchie, Dental Record.*

DESTRUCTION OF CAOUTCHOUC BY MICROBES.—Microbes do not attack commercial caoutchouc which is kept in dry air, but when a small amount of moisture is present certain bacteria and molds derive nourishment from the albuminoids, resins and sugars which the rubber contains. Some microbes form on the caoutchoucs spots of various colors, red, yellow, black or brown, but the rubber is not materially altered thereby. On the other hand, two species of actinomyces, very common in garden earth and in canals, *Actinomyces elastica* and *A. fustus*, assimilate the hydrocarbons of the caoutchoucs, and are in consequence capable of modifying its properties in such a way as to deprive it of all commercial value.—*Revue Scientifique, per Brit. Dental Journal.*

CONSTRICTED PULP CANALS.—When a constriction in a pulp canal is met with in upper bicuspid the mouth lamp can be placed on the lingual or buccal and the canal illuminated. The continuation of the canal is seen as a small black spot. Place a fine drill-in engine on this spot, and a few revolutions of the engine will cause it to jump through into the canal beyond the constriction.—*E. S. Best, D.D.S., Minneapolis (Dental Review).*

In Memoriam

DR. GREEN VARDIMAN BLACK.

LEAVING behind him a record of marvelous accomplishment, Dr. Green Vardiman Black died Tuesday, 31st August, 1915, at Walnut Lodge, the farm home of his boyhood. Dr. Black lived for seventy-nine years and for more than half a century he devoted almost his every thought to the development of scientific problems related to dentistry. It was in 1910 that a banquet was given in his honor in Chicago where dentists from all parts of the world to the number of 400 gathered to do him honor and present to him gold and silver tokens in material acknowledgement of their debt to him.

In experimental work, in invention, in hundreds of pamphlets and books, Dr. Black can be truly said to have accomplished more for dental science than any other one man. At the banquet in 1910 the guest of honor was called upon last, and in a characteristic, modest way, framed his thanks briefly to the men who had gathered to do him honor. In closing he gave expression to the chief thought that was in his mind when he said that he did not have a "goodby" for his friends but rather a "goodnight." Though he had passed the mark of three score and ten, he did not believe that his work was over—that there were many things in his mind that ought to be done and that he hoped he might be able to do them. "I love the work I have been doing and I am not ready to quit." And so it was given to him even in the years following that night to accomplish still other great things for the profession to which he had unselfishly given the best years of his life.

Dr. Black was so wrapped up in his work, so intent on the great things that he was accomplishing, that he had no thought of material gain or personal aggrandizement. His purpose was to solve unsolved problems in science, to perfect methods and apparatus, and to so develop theories that they would become practical aids to the dental profession and thus to humanity. His work was for all men, and with singular self-forgetfulness he gave unsparingly of his time and his great mentality for the world at large. While his work was such that he came to be a recognized dental authority the world over, his simple habits of life and the kindly approachableness of his manner never changed.

The stories of his deep and unassumed interest in young

and struggling practitioners are many, and he had that quality of heart, gentleness, which marks many men who are really great. His long life has closed; he has not lived in vain, and no monument could be erected in his memory which would give half the glory to his name that will come through the years from the recollection of his work. The mere statement that he contributed largely to the text-books and literature of dentistry conveys but little idea of how large his contributions have been. A list of pamphlets and books from his pen was compiled several years ago and occupies twenty pamphlet pages. He began writing in 1866 and from that time dental treatises came steadily from his pen, his activity in this line continuing until but a few months ago.

Dr. Black's death was caused by pernicious anaemia. He had been afflicted with this disease for some time and the condition became such that it was his great desire to go to the old farm house in Cass county which he loved so well. He was taken there, and for a time seemed to improve, but later his condition became such that it was thought best to notify the members of his family. Dr. and Mrs. Arthur D. Black, their son, Gilmer, and Miss Clara Black were in California when they received the telegram notifying them of their father's condition and they returned at once and were at Dr. Black's bedside when the end came.

The deceased was born in Scott county August 3, 1836, and was the son of William and Mary Black. He was a great-grandson of Capt. William Black, an officer of the Militia in North Carolina. After a residence of ten years in Scott county the family moved to Cass county, settling upon the farm where Dr. Black's final days were passed. His boyhood was passed upon that farm, and every foot of it held for him some dear memory. In the latter years of his life, when seeking rest from some nerve-consuming labor, there was no place that seemed to give him such rest of mind and body as this farm home. Last year he spent much of the summer there, and it was with reluctance that he left in the fall to return to Chicago.

Dr. Black served as a sergeant in the Civil War and was engaged much of his time in special scouting duty. He received an injury to his knee joint which kept him for six months in a hospital in Louisville, Ky. Subsequently he went to Jacksonville and opened a dental office, first applying himself to the study of chemistry and establishing a complete working laboratory in connection with his office. He organized a class in chemistry among the public school

teachers, which he taught several years, and also took a prominent part in the medical organizations of the city and county. With passing years he became widely known as an author and lecturer on scientific topics pertaining to his profession. His writings have gained such prominence that they have been translated into many languages and are considered standard authority on the subjects discussed. Original drawings have been features of all Dr. Black's books.

In addition to his work as a writer and teacher, Dr. Black was an inventor, and it was he who designed and patented one of the first cord transmission dental engines. The present methods of preparing cavities in teeth, and the methods of inserting and making gold and amalgam largely resulted from his investigations. For more than a quarter of a century he has stood pre-eminent as an original worker and his name is known among dental and medical men the world over. For a period of ten years ending in 1880 he lectured on pathology, both general and dental, in the Missouri Dental College in St. Louis. Subsequently from 1886 to 1889, he lectured in the Chicago College of Dental Surgery; then he became identified with the dental department of the University of Iowa, from which position he was called to Northwestern University, and was made the dean of the dental department in 1897. He was the first president of the State Board of Dental Examiners in Illinois; served as president of the Illinois State Dental Society and the American Dental Association, and for a long period of years represented Northwestern University in the American Association of Dental Faculties. He was president of the section on pathology of the International Dental Congress during the World's Fair in St. Louis, also of the Panama-Pacific Congress, now in session in San Francisco.

He was awarded the first gold medal by the Dental Society of the State of New York for scientific research and also the first Miller prize, the latter being a gold medal voted by the International Dental Federation for the most valuable contributions to the literature and scientific advancement of the profession. Dr. F. Aguillar, of Madrid, was commissioned to come to Chicago to make the presentation in person.

In recognition of his distinguished services to the dental profession a banquet was given in Dr. Black's honor January 29, 1910, in the gold room of the Congress hotel in Chicago, by the Chicago Dental Society.

HIS UPLIFT WORK.

Upon that occasion one of the speakers said: "We need

not discuss the work of Dr. Black for, after all, the greatest achievement is that he has left his impress upon dentistry by the intellectual uplift he has given us in enabling us to understand and appreciate the scientific method as applied to our work. Dr. Black's life work is his honor and we can but express our appreciation of what he has done for us and say, God bless him for what he has done, not only for the dental profession but for the uplift, for the help, for the benefit that he has conferred upon humanity at large.

"As a man he is really the marvel of the age, for in his lifetime he has accomplished more perhaps than can be credited to any other one man in the dental profession. It was, indeed, a great day for dentistry when Dr. Black was born, and when one contemplates the vast amount of work that he has done, it seems almost beyond comprehension that so much was accomplished even through the long years of his devoted work."

Dr. Black was given the degree of D.D.S. by Missouri Dental College in 1877. In 1884 he received the M.D. degree from Chicago Medical College, and in 1892 Sc.D. from Illinois College and LL.D. from Northwestern University in 1898.

DR. BLACK'S LIFE SUMMARIZED.

A historical sketch of Dr. Black compiled several years ago gave the following as the leading events in his life:—

Born near Winchester, Scott county, Illinois, August 3, 1836.

Family moved to farm seven miles southeast of Virginia, in Cass county, Illinois, in 1845.

Attended country school about three months each winter.

Studied medicine with Dr. Thomas G. Black, a brother, at Clayton, Ill., 1853-1856.

Studied dentistry with Dr. J. C. Speer, Mt. Sterling, Ill., 1857.

Practiced dentistry at Winchester, Ill., 1858-1862.

Enlisted in 129th Illinois Volunteers, 1862.

In hospital at Louisville, Ky., six month, and discharged for disability, 1863.

Practiced dentistry in Jacksonville, Ill., 1864-1897.

Joined Missouri State Dental Society, 1866.

Joined Illinois State Dental Society, 1868.

First important dental paper on "Gold Foil" read before Illinois State Dental Society, 1869.

President Illinois State Dental Society, 1870-71.

Invented one of the first cord driven, foot power, dental engines, 1870.

Lectured on pathology, histology and operative dentistry, Missouri Dental College, 1870-1880.

First president of the Illinois State Board of Dental Examiners, 1881-1887.

Wrote book, "The Formation of Poisons by Microorganisms, 1884.

Professor of Dental Pathology, Chicago College of Dental Surgery, 1883-1889.

Introduced teaching of Dental Technics, Chicago College of Dental Surgery, 1887.

Wrote for the American System of Dentistry, chapters on "General Pathology," "Dental Caries," "Pathology of Dental Pulp" and "Diseases of the Peridental Membrane," 1886.

Wrote book, "Periosteum and Peridental Membrane," 1887.

Voted life membership in Illinois State Dental Society, 1889.

Professor Dental Pathology and Bacteriology, Dental Department, University of Iowa, 1890-91.

Wrote book, "Descriptive Anatomy of the Human Teeth," 1891.

Wrote series of articles entitled, "The Management of Enamel Margins," Dental Cosmos, 1891.

Professor Dental Pathology and Bacteriology, Northwestern University Dental School, 1891-1897.

Chairman Section on Etiology, Pathology and Bacteriology, World's Columbian Dental Congress, 1893.

Report on Dental Nomenclature, World's Columbian Dental Congress, 1893.

Wrote series of articles entitled, "An Investigation of the Physical Characters of the Human Teeth in Relation to Their Diseases and to Practical Dental Operations, Together With the Physical Characters of Filling Materials," Dental Cosmos, 1895-96.

Dean and Professor of Operative Dentistry, Dental Pathology and Bacteriology, Northwestern University Dental School, 1897, to the time of his death.

President National School of Dental Technics, 1897.

President National Dental Association, 1900.

Awarded First Fellowship Medal, by the Dental Society of the State of New York, 1905.

Special Guest at Annual Meeting of American Dental Society of Europe, 1906.

Wrote work on "Operative Dentistry," in two volumes, 1908.

Voted Miller Prize for most valuable contributions to dental science and literature by the International Dental Federation, 1910.

Wrote book on Special Dental Pathology, 1915.

Mrs. Fred Conboy

IT is with feelings of deep regret that ORAL HEALTH chronicles the death of Mrs. Conboy, wife of Dr. Fred J. Conboy, Toronto. Sincere sympathy is extended to Dr. Conboy and son in their sad bereavement.

Mrs. F. J. Capon

As we go to press word has been received of the death of Mrs. F. J. Capon, wife of Dr. Fred J. Capon, of Toronto. Mrs. Capon has been poorly for the last six months, and was thought to be progressing favorably after an operation. Oral Health extends its sympathy to Dr. Capon in his great bereavement.

Oral Hygiene Work Organized in Philadelphia Hospital

The importance of the mouth as a source of infection and as a region from which many diseases originate is gradually becoming recognized by all medical men. Hospital authorities have come to the conclusion that oral surgery is a practical thing in this age and are advocating its establishment in every hospital in the country. As a result of this movement, the Germantown Dispensary and Hospital has been the latest institution to establish the service of oral surgery with great success.

Though only a few months old, the oral surgical department of the Germantown Dispensary and Hospital has benefitted scores of patients affected with mouth disease. The position of the oral surgeon has been created so that all ward patients are given the benefit of the latest scientific knowledge regarding the care of the mouth and teeth, so that they may be guarded against post-operative infections. In this manner all cases of pyorrhea, caries, etc., which often give rise to systemic infections, are studied and properly treated.

Book Review

NOTES ON DENTAL ANATOMY AND DENTAL HISTOLOGY, HUMAN AND COMPARATIVE— A POCKET TOMES.

BY T. W. WIDDOWSON, L.D.S.

ANY person engaged in a profession that has made such rapid progress as the profession of dentistry has made in recent years must, of necessity, read a great deal of the literature relating to his profession if he desires to keep pace with the advance being made. For the busy practitioner, it is almost impossible to read and digest the mass of literature that is necessary to present the ever-changing and improving knowledge that the leaders in the profession have acquired. For the under-graduate, it is much more convenient to have the important features placed before him in brief and concise form than to be compelled to glean a few outstanding points from a large volume of reading matter.

The subjects, "Dental Anatomy" and "Dental Histology" (human and comparative) have recently been placed before the profession in excellent form by T. W. Widdowson, L.D.S. To many of us Dr. Widdowson is already known through his previous efforts, viz., "The Care and Regulation of Children's Teeth," "Notes on Dental Surgery and Pathology," and his connection with ORAL HEALTH as contributing editor.

The reviewer may either greatly enhance or greatly diminish the selling value of a book making its debut before the public, but when any book has proven its usefulness to such an extent that a third edition, in enlarged and revised form, becomes necessary, there is very little opportunity left for criticism. Such has been the early history of Dr. Widdowson's "Notes on Dental Anatomy and Dental Histology."

The book has been called a "Pocket Tomes." This name is, perhaps, misleading, because the book measures eight and three-quarter inches long by five and three-quarter inches wide and contains 185 pages of printed matter. However, it gives a very good idea of how greatly the subjects have been condensed for ready reference. A special feature of the book is the blank pages with which it is interleaved for the reader's notes and drawings. It is illustrated with 113

electrotype illustrations, many of which are from such well-known authors as Mr. Charles Tomes, Mr. Hopewell-Smith, Dr. John Sayre Marshall, Dr. G. V. Black, and Dr. F. B. Noyes.

Chapter I. deals with enamel. It gives its properties, approximate composition, structure, distribution and imperfections. Chapter II. classifies and describes the various kinds of dentines. Chapter III. is devoted to the Cementum or Crusta Petrosa and the pulp with its blood and nerve supply. Chapter IV. describes the peridental membrane, its origin, functions, distribution, blood and nerve supply; also the gum with its origin and function and Nasmyth's Membrane. The first part of Chapter V. deals with the development of the human teeth, beginning with the earliest cell division. The second part of this chapter briefly describes the development of teeth in various classes. Chapter VI. describes the calcification of the enamel, dentine and cementum, and is illustrated by a diagram showing the progressive calcification of the temporary and permanent teeth and decalcification of the temporary teeth covering the period from early embryonic life to the twentieth year—a very useful diagram. Chapter VII. shows the development of the jaws from early embryonic life with the changes preceding teething. The subject of Chapter VIII. is the eruption of teeth; the theories advanced for the cause of eruption; the approximate dates of eruption; the agents determining articulation; the absorption of the roots of temporary teeth, etc. Chapter IX. illustrates the different methods of attachments of teeth and is followed in Chapter X. by a description of the forms of human teeth, their arrangement in the arch and their relation to other dermal appendages.

The remaining chapter of the book (XI. to XXI.) discuss the subject of Comparative Dental Anatomy. The first of these presents the theories of Adaptive Modification or Natural Selection, Correlation of Growth or Concomitant Variation, Serual Selection or Survival of the Fittest, and the existence of multi-cuspid teeth. It also defines the terms used and gives the functions of the teeth. Chapter XII. divides the animal kingdom into its two sub-kingdoms, viz.: Invertebrates and Vertebrates, and points out the general differences between them. The following chapters describe the teeth of the various classes of the vertebrate series, beginning with the lowest types. When the class known as mammalia is reached, it is again subdivided into its different orders and a more detailed description is given of each. Particular stress is laid upon the comparison of

the teeth of man with those of the higher forms of apes. The author brings his work to a close with a pleasing and instructive chapter, entitled "Special Characteristics of Skulls, Bones, Muscles of Jaws," etc.

The volume is full bound in blue cloth, lettered on the back and side in gold. The type is moderately bold, being quite clear and easily read. It is executed on paper of extra good quality. The volume is published by Messrs. John Bale, Sons & Danielson, Ltd., London, Eng. Price, 7s. 6d.—R. D. T.

Panama Pacific Dental Congress

THE Panama Pacific Dental Congress has passed into history, and in accordance with the opinion very generally expressed by those in attendance, the meeting was a decided success.

The Pacific Dental Congress Commission of 1915, the corporation now in charge of all matters relating to the Congress and the publication of the transactions, desires to announce that a copy of the complete transactions, when published, and a copy of the official souvenir programme, will be sent to anyone making application therefor to the Secretary of the Commission, Dr. Arthur M. Flood, 240 Stockton street, San Francisco, California, and forwarding the fee of ten dollars.

Those subscribing for these extra copies of the transactions cannot be regarded as being members of the Congress, not having applied for membership before the meeting, or being in attendance at the same, but we believe these transactions will be a very valuable addition to the history of dentistry, and the souvenir programme, containing as it does, many items of historical interest and value, will be acceptable to any member of the profession.

PACIFIC DENTAL CONGRESS COMMISSION OF 1915.

Arthur M. Flood, D.D.S., Sec'ty.

FACILITATING THE MANAGEMENT OF PATIENTS WITH FULL MOUSTACHES—Patients with full moustaches are often difficult to work for, on account of the moustache shutting off the light. To prevent this, a piece of linen, about an inch wide, is fastened with the rubber dam holder across the lip.—*Australian Journal of Dentistry (Dutch Cosmos)*.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

FEW dental subjects have been more frequently discussed than that of dental amalgam alloys. Most writers have, however, dealt with the subject from a purely technical standpoint, consequently those who have forgotten their early instructions in chemistry fail to find interest therein. A paper read before the Seventh District Dental Society of New York by Dr. A. Osgood, Bath, N.Y., and reported in the September issue of *Oral Hygiene*, adds new interest to an old subject. In view of the fact that the author has had the experience of very many years of active practice, we are compelled to give due recognition to his findings. He points out that the first essential to successful amalgam work is a small balance for weighing the mercury and alloy. A glass mortar is used for mixing. The contents are then scraped out with a broad rubber scraper into a steel mould, where force is applied by hand pressure. A cylinder of amalgam is thus obtained and is broken up into portions of suitable size for insertion into the tooth cavity. Dr. Osgood claims that if this method is followed there will be at no time during the operation a surplus of mercury, no matter what force is used in condensation.

The use of a matrix in all proximo-occlusal cavities is essential. In shaping the proximal surface of the filling, narrow strips of architect's cloth are used, because of its thinness and great strength.

An advantage claimed for the use of dry amalgam is that the filling may be finished at time of insertion, because of the rapidity of crystallization in the alloyed mass. A pledget of cotton, held in the pliers, is passed a few times over the surface of the filling and produces a fine finish. The tendency to "spheroid" and "flow," so characteristic of the average amalgam filling, is absent altogether when the amalgam is prepared and manipulated by this method. Dr. Osgood says: "I never find a filling endeavoring to climb instrument over the surface of a tooth, and a filling that has out of a cavity,—you can pass the fine point of an exploring

been placed at some former period, without finding any unevenness." Any method that will produce such satisfactory results must needs be worth adoption.

Another excellent treatise—"Standardizing the Amalgam Filling"—has been prepared by Dr. Walter G. Crandall and issued by the Cleveland Dental Company. The author deals extensively with the question of cavity preparation and numerous illustrations are used to show the outline form, resistance form, retention form, etc. At some considerable length the problem of dental alloy metals, methods of alloy making, manipulation and instrumentation are discussed. It is worthy of notice that Dr. Crandall is in agreement with very many other investigators when he insists upon the use of definite predetermined proportions of alloy and mercury in the amalgamating process. He says: "An excess of mercury will cause a shrinking alloy to shrink more, an expanding alloy to expand excessively, and a closely balanced alloy to first shrink and then expand."

For mixing, a wedgewood mortar is used, with a pestle large enough to cover practically the entire inner surface of the mortar. In this way all portions of the alloy are brought quickly into intimate association with the mercury. Best results are obtained by keeping the amalgam dry during its manipulation, as the strength is greatly decreased should the filling material come into contact with moisture.

A form of matrix made from sheet copper, 36-gauge, and secured about the tooth with floss silk, is recommended.

ROOT CANAL TREATMENTS.

A timely word of warning against the indiscriminate use of drugs by dentists comes from Dr. C. M. Cahill, Chicago, in a paper read before the Illinois State Dental Society and reported in the September issue of *Dental Review*. Dentists are urged to become thoroughly familiar with the properties of the drugs which they use. Among the drugs selected for special mention are:—

Formaldehyde. Owing to its being caustic and corrosive to soft tissues, this drug should be handled with great caution. When used in tooth cavities it should always be cemented in, because if placed under temporary stopping or similar material it is apt, when pressure is applied to the stopping, to find its way out of the cavity and onto the surrounding tissues. Or, a small amount of the dressing may be forced beyond the apex of the root, causing soreness and loosening of the tooth. The stopping material acts as a plunger in forcing the contents through. Tribute is paid

to the efficacy of formalin and its combinations in treating abscessed and putrescent pulps. When used as a root canal filling, however, a gutta percha point should be added in order to insure the complete sealing up of the canal.

Arsenious Trioxide. When this drug has remained in the tooth long enough to cause arsenical pericementitis, it is recommended that oil of cloves be used to correct this condition. The method of procedure is to expose the pulp and remove the contents. Then place a drop or two of oil of cloves well into the canals. Volatilize with hot air. Finally cement in a few fibres of cotton which have been previously saturated with this agent, and leave for a few days. Judging from the information contained in a report of biological tests for arsenic conducted by Dr. Herman Prinz (see *Cosmos*, July, 1915), it would seem probable that dentists are accustomed to use arsenic too freely when devitalizing the tooth pulp. In this report it is shown that 1 grain of arsenic is capable of destroying 1,400,000 pulps, or the average pulp requires for its complete destruction only 1/1,400,000 of a grain of arsenic. The author points out that "Metnitz successively killed with the same pellet of arsenic paste, sixteen pulps, and the pellet still retained enough arsenic to cause necrosis in the leg of a frog." The pulp will absorb the amount of arsenic necessary for its destruction, and no further absorption takes place. The inference, from the extensive experiments made by these investigators, is that when destroying dental pulp by the use of arsenic, smaller quantities should be used and allowed to remain in the tooth for a longer period.

Sulphuric Acid. Dr. Cahill warns dentists against the insufficient neutralization of this acid when used in enlarging tortuous root canals or removing shreds of pulp tissue. If uncontrolled, sulphuric acid or phenol-sulphuric acid are likely to cause loosened and tender conditions of the teeth. To avoid the possibility of this he advocates the practice of sealing in the root canals, so treated by sulphuric acid, an alkaline solution (sal. sod. bicarb.) for at least 24 hours before filling the canals. Objection might be taken to this in view of the fact that if the effervescing material is sealed in securely some irritation is bound to occur at the apex of the tooth.

SILICATE CEMENTS.

One of the chief reasons urged against the use of silicate cements is that they are more or less soluble when brought into contact with fluids in the mouth. A very able exposition of this phase of the question comes from the pen

of Dr. Charles E. Jones and is published in the August issue of *The Dental Register*. The author recognizes that the dental chemist has before him, in the preparation of a silicious cement suitable as a filling material, a most difficult task. The materials suitable as ingredients are very limited in number. If satisfactorily manipulated, however, the cements now procurable will give excellent results; yet we cannot claim for them the same degree of permanency as is to be obtained by many metal fillings. There is reason to hope that in the near future improvements in manufacture will render the field of usefulness for silicate cements more extensive.

Concerning the constituents of the silicious cements; the liquid—a solution of phosphoric acid together with modifiers; the powder—finely ground silicates and aluminates (aluminum oxide, calcium oxide, silicon dioxide, phosphoric pentoxide, etc.). The phosphorous content is incorporated in order to give translucency. The aim of the manufacturer of silicate cements is to produce a material of practically insoluble properties. Were the powder to consist only of a fused mass of basic oxides, then the liquid phosphoric acid would have little effect in bringing about the crystallized mass as represented by the completed filling, hence calcium is added so as to permit the ready action of the acid.

In mixing the silicate powder and liquid together a series of three kinds of salts may be formed, because ortho-phosphoric acid is tribasic. These calcium salts may be either of the primary, secondary or tertiary variety. The primary salt (phosphate) is known to be very soluble. The tertiary or normal salt is practically insoluble, and so the cement mass containing it will not disintegrate.

The question may be asked: "Can it be possible to form three different salts from the same ingredients"? Yes. If in mixing the powder and liquid thorough spatulation is *not resorted to*, then salt with soluble properties is formed. Dr. Jones says "that we can nearly always make an insoluble agglomerating mass out of the product first produced when the phosphoric acid and basic calcium oxide are brought together by *thorough and prolonged spatulation*." Spatulation brings the constituents into close physical relationship and permits the hydrogen atom of the primary and secondary salt formation to break away, thus forming the normal insoluble mass.

INTERRELATION OF THE TEETH AND THE EYE.

Under this heading Dr. W. T. Davis, of Washington, in a paper read before the Dental Society of the District of

Columbia (*Cosmos*, July, 1915), brings to our attention the very great possibility of many grave ocular disturbances being due to dental irritation. The charge that one is going far afield in order to connect up these two branches is ably refuted by the essayist, who points out that the fifth or trifacial nerve supplies both the teeth and the eye with sensations; the superior maxillary nerve is the principal communication between the fifth and the facial nerves.

The possibility of ocular disturbances being due to oral infections is placed beyond the probability of doubt by reason of the clinical evidence submitted. Cases of blurring of vision and mild optic neuritis were cured by the extraction of abscessing roots. Irritation from dentition in infants is shown to have caused abscess or ulcer of the cornea.

Dr. Davis, in closing his excellent paper on this subject, urges dentists to give greater attention to their own eyes. Dr. Black is quoted in this connection: "Care should be observed in arranging light for your office. No cross lights, not too much light. The latter produces weariness of the eyes from long-continued contraction of the pupil." The dentist is constantly looking at objects close at hand. This calls for "accommodation"—a muscular action. All muscles get tired. Dentists ought to consult an oculist once a year in order to avoid trouble.

POINTS IN SOLDERING.

The August issue of *Cosmos* contains an article by Dr. E. L. Kanaga, Philadelphia, which teems with useful points on soldering. It is pointed out that the strength of a soldered joint depends upon (1) the amount of solder used, (2) the surface of contact, (3) the degree to which the solder is fused into the other metals. The author in explaining the process of soldering uses the phrase "burning in." This is the process of keeping the pieces soldered together hot for a time after the solder has melted. This causes an alloy of the two metals to be formed. There is the necessity of having the two surfaces to be soldered in close contact, because if they are separated more solder is required to fill the space, and this cannot all be "burned in." Here, then, the strength of the joint is dependent upon a quantity of weak and brittle metal.

The author claims that the ideal method of soldering is to use less and less solder until the operator becomes so proficient that he can actually melt the two joints together. A joint so formed (sweated), does not show, is stronger and will not re-open at a subsequent soldering.

In soldering gold, keep the surface well covered with the flame, so as to prevent oxidation. If the flame is held away from the gold, oxidation and consequent retardation of the flow of solder results.

An investment material, which consists of bird-gravel, one part, and plaster, two parts, is recommended. The idea of investments is not to protect the piece from burning, but merely hold the parts together during the process of soldering.

The practice of coating all parts of the piece to be soldered with thick borax paste is discouraged. Borax more than anything else, causes checked facings, because wherever it touches the porcelain it brings about a lowering of the fusing point of the porcelain—hence fracture of the facing. The solder should receive the flux. If, when the solder has solidified, it is found necessary to add more, then bring the entire mass to a liquid condition. This will prevent the occurrence of pits, which are due to the incorporation of borax beneath the surface.

The cause of broken facings is attributed to three errors in manipulation, “burning borax into the porcelain, too close contact between the facings and the rapid heating of the pins.” Allow room for expansion of facings when heated, and do not burn out the wax from the investments. If the wax is burned out there is a danger of fracturing the porcelain before soldering begins, because as soon as the least flame touches the pins expansion takes places.

HERE'S ANOTHER.—After God had finished making the rattlesnake, the toad, and the vampire, He had some awful substance left, with which He made a knocker. A knocker is a two-legged animal with a corkscrew soul, water-logged brain and a combination backbone made of jelly and glue. Where other men have their heads, he carries a tumor of decayed principles. When the knocker comes down the street, honest men turn their backs, angels weep tears in heaven and the devil shuts the gates of hell to keep him out.—(*Dental Summary*).

Back Copies of Oral Health

D R. W. E. CUMMER, 2 Bloor St., Toronto, is anxious to secure two copies of *O R A L H E A L T H*, as follows:—January, 1913; January, 1914.

ORAL HEALTH

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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. 5

TORONTO, OCTOBER, 1915

No. 10

EDITORIAL

Rochester Follows Boston

ROCHESTER has followed closely upon Boston in the magnanimity of one of her wealthy citizens toward the Oral Hygiene movement. Mr. George Eastman has endowed a Dental Infirmary, to be known as "The Rochester Dental Dispensary." The total gift will approximate a million and a quarter dollars. One cannot disassociate this magnificent gift from the pioneer work carried on for many years by the Rochester Dental Society and the successful operation of the Rochester Free Dental Dispensary. In this connection the name of Belcher and his associates in the publication of *The Dental Dispensary Record* will ever command a large and honorable place.

The good seed of "Dental Hygiene" has been sown broadcast during the past few years and has taken firm root. The movement has developed in a wonderful way and is bearing abundant fruit. Doubtless a recognition of the importance of Oral Hygiene will continue to spread from city to city and ultimately make itself felt in a practical way throughout the rural districts of the community as well.

The hour has undoubtedly arrived for the dental pro-

fession to give more serious consideration to the best methods of reaching every class in the community and of the basis upon which the organization of dental service for the poor should rest. The problem varies as we deal with the urban and rural citizen, the rich, the poor, the child, and the adult. How is each class to be reached in the best way with the least expenditure of energy and expense?

The examples of Boston and Rochester will no doubt be frequently quoted and prove powerful factors in establishing dental clinics elsewhere. However, it remains for the dental profession to consider whether the ideal plan of infirmary organization is one resting entirely upon private philanthropy. Local conditions must, of course, be considered, but there are certain general principles that might be clearly defined and followed as closely as circumstances permit. Is a large central clinic for children preferable to dental clinics in the school building? Which plan lends itself the better to the development of preventive work among children?

These fundamental questions, and others affecting the rural school problem and methods for the further advancement of the Oral Hygiene propaganda, demand the further consideration of the profession that there may be a minimum of waste energy and an avoidance of mistaken policies which might give the whole Oral Hygiene movement a serious setback.

“The Compendium”

ATTENTION is drawn to “The Compendium,” a new department in ORAL HEALTH, edited by Dr. Thomas Cowling. Sufficient space will be devoted in his department each month to a comprehensive review of current literature relating to the science and practice of Dentistry.

Few dentists find time to read systematically more than two or three dental magazines, and consequently miss much of value appearing in other journals. The object of “The Compendium” is to present to the busy practitioner a synopsis of the better articles published, with complete information as to the issue in which the article appeared. This will enable the readers of ORAL HEALTH to not only avail themselves of an epitome of current dental literature, but to easily refer to the original article where special study of the subject is desired.

We believe the profession will greatly appreciate Dr. Cowling’s effort in this department.

Recent Advance in Dental College Standards

AS illustrating the advance in dental standards during the past few years, the following resolutions passed by the Dental Council of the State of Pennsylvania are of much interest:—

November 7, 1912.—It was resolved that for admission into the dental schools in the fall of 1914 and thereafter, the standard of requirements be a four-year high school course or its equivalent, and that the dental schools be notified of this action.

May 23, 1913.—It was resolved that after January, 1915, students must enter the Dental College without conditions.

October 1, 1915.—Resolved, that students who enter a Dental College with conditions in their four-year high school course or its equivalent in the fall of 1915 will not be admitted to the dental examination on graduation from the three-year dental course.

October 1, 1915.—Whereas, the Pennsylvania Legislature has lengthened the dental course to four years, beginning with the fall of 1917, and

Whereas, the students who enter in the fall of 1915-16 will be expected to do four years' dental work in a three-year dental course, and

Whereas, students from Pennsylvania are required to present evidence of four years' high school preliminary education without conditions prior to entrance upon the Freshman Year of the dental course; now, therefore, be it

Resolved, that it is the sense of the Dental Council that students entering Dental Schools with conditions in their preliminary requirement cannot satisfactorily complete from four to five years' work in three years, and that, therefore, a Dental School cannot be considered reputable if it continues to admit students with conditions in their four-year high school requirement.

Oral Hygiene Reports

Seattle, Wash.

A city-wide "tooth brush" day was observed in Seattle, Wash, on September 22nd. On that date, 30,000 school children were taught the care of the teeth in connection with a campaign of the city-wide welfare institute. The programme of the day included moving picture shows illustrating the proper brushing of teeth, and diagrams showing the manner in which teeth decay.

Kalamazoo, Mich.

A dental clinic has been established by the School Board. A dentist will be in charge whose duty will be the examination of the teeth of children in the graded schools. Parents will be notified of any defects found and are free to consult the family dentist. Children who are unable to pay for treatment, will be referred to the Dental Inspector for attention.

Wyoming, Wis.

Physical examinations of all school children in Wyoming have been begun by the regular teachers of the respective grades, for the detection of eye, ear, nose, throat and teeth defects. The examinations are provided for in a state law requiring that they shall be made without the laying on of hands or instruments, and that they shall consist merely of close observations of the habits and general appearance of pupils. The results are recorded on cards which are to be filed in the office of the State Superintendent.

Worcester, Mass.

A free dental clinic for children of all nationalities has been opened at Worcester, Mass, under the direction of Dr. J. J. Cooley. A course of lectures will be given for children and parents, and pamphlets on the care of teeth will be issued from time to time.

Poughkeepsie, N.Y.

ORAL HEALTH desires to acknowledge receipt of Invitation to attend the public opening of the Poughkeepsie Dental Dispensary, Saturday, October 9th, 1915.

Iowa.

The Iowa State Dental Society is planning a state-wide oral hygiene campaign in co-operation with the parents and school authorities.

FOR SALE: Practice of over \$4,000 annually, Eastern Ontario. Nice country home and garden. No other dentist nearer than fifteen miles. Good reasons for selling. Don't write unless you mean business. Address Opportunity, c-o Oral Health.

DENTAL SUITE—Reception room, laboratory and operating room in new building (ground floor), finished to suit tenant. Excellent locality; good opening for new man; ready for occupation November 1st. Apply C. F. Davis, 468 Dovercourt Road (Corner College) Toronto.

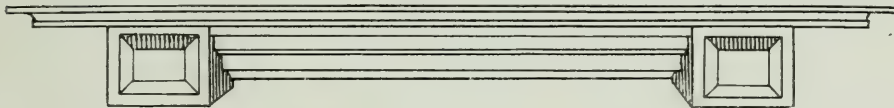
International Interest Shown in Canadian Army Dental Corps

CANADIANS are proud of the Canadian Army Dental Corps, and will be glad to learn that the organization of the corps is being studied and appreciated by countries outside of Canada. The London "Evening News" recently published an article containing an interview with a dental surgeon, who had just returned from a holiday at Folkestone, in which he spoke of the excellence of the Canadian Army Dental Corps, the headquarters of which are now at Shorncliffe.

The article continues: "Many of the dental surgeons comprising the corps have given up lucrative practices in order to serve. There are men from places as far apart as British Columbia in the west to Nova Scotia in the east, a distance greater than that between Canada and Great Britain.

"If any doubt existed as to the need of the corps' existence, a visit to any of the various clinics and laboratories would soon dispel it. Every branch of dental work is done with the dispatch and thoroughness that characterize a city office.

"Already information regarding its establishment and equipment is being sought by other countries with a view to adoption in their own armies."





Major A. A. Smith
Acting Chief Dental Surgeon, Canadian
Army Dental Corps

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 5

TORONTO, NOVEMBER, 1915

No. 11

*The Progress of the Research Commission of the National Dental Association**

BY WESTON A. PRICE, D.D.S., M.S., CLEVELAND, OHIO.

THE most significant thing in the dental profession to-day in my judgment is this psychological moment or age in which we are living, and I wonder if we, as a profession, appreciate the opportunities we have in living to-day. I am wondering if we really realize that we are the gatekeepers, if not the keepers of the gate, and by keepers of the gate I mean the gate to the grave, if we may judge from the literature that comes to us from many of the writers of to-day.

I wish to emphasize our present situation by contrast and I want you to go back with me just a few hundred years and see a band of men and women driving children with switches to the tomb of St. Vitus to be cured of St. Vitus' dance, some of them driven one hundred miles, two hundred miles, made to limp and trudge and force themselves along over that very road. Why? Because they had infection in their system which was affecting their nervous organization and which was very liable to affect their heart. How well we know that the infection may express itself in the human organism in various ways, but in this instance as St. Vitus' dance or chorea. Maybe the next week it expresses itself as an endocarditis. Those children I have referred to should

*Address before the Illinois State Dental Society, May, 1915.

have been put to bed and kept quiet, but instead of that they were whipped over those roads to the tomb of St. Vitus to be cured.

I want to give you another picture. It is in Genoa. One day a man walked along the roadway, he had a writing quill and got ink on his fingers, and he rubbed the ink off on a wall and he was seen. What a terrible thing he had done. That community believed that an epidemic of disease was caused by a man who was possessed of an evil spirit; that by rubbing or smearing the walls with an unction he contaminated the whole community, and if they could find that person they would stamp out the disease and the great epidemic would be stayed. A woman saw him, in the act of doing it, from a window and the man supposed to have been spreading disease was caught. They tortured him. They asked him where he got the unction, and in his awful agony he told them he got the formula from an apothecary store at the corner, and they went to the apothecary, and the druggist implicated others until five thousand people were involved and put to death, and the home of the druggist was torn down and a great monument was built in its place to warn others.

Within the history or lifetime of the great grandfathers of dentists in this room, in Salem, Massachusetts, the lives of twenty people were put out because they were thought to be witches and disturbers of the community. What was it? Nothing but hysteria. To-day we think that is tragic, don't we? When we look at the progress of the past centuries, and when we open the door of the future and see the writing on the wall that indicates what is possible in the next fifty years, we are led to-day to think that we are relatively not so much more civilized than those people as we think.

I want to emphasize again that this is one of the psychological moments in the history of the dental profession, because never before have all the leaders of the healing art looked to us as they do to-day for the solution of problems which we are more competent to get answers for than they. "The question is, will we do it?" Have we realized that the great scourges that took off thousands and hundreds of thousands of people, amounting to sixty millions of people with one disease within a hundred years in Europe, have been stayed? The great masses of people are not dying to-day of typhoid fever, of diphtheria, of yellow fever, of cholera, of smallpox. Why? Those infectious diseases which kill quickly are understood sufficiently to-day so that we can quarantine them and prevent their spread.

The life rate has changed within fifty years, so that in this community, instead of fifty people per thousand dying every year, there are probably less than fifteen. What has brought that about? The elimination of the infectious disease, the contagious diseases, as we call them. Of what are people dying to-day? Dr. Mayo is authority for the statement that probably not ten per cent. of the people to-day die a physiological death. How do they die? From some of the chronic disorders we say. What are they? Bright's disease, heart disease, liver disease, gall-stones, or we may use the later name of cholecystitis. But when we come to analyze these various affections and come right down to the basic principle we find that these diseases are largely symptoms.

Last week at our State Medical Society meeting in Ohio, one of our leading internists made the statement that we must drop from the literature such words as dropsy as a disease, gall-stones as a disease, or peptic ulcer as a disease. Why? They are only symptoms of disease. They are not diseases. What is a disease? A disease is generally that condition in which some particular tissue or organ is affected; there has been blocking of a very small blood vessel by the driving of organisms through the circulation, and that particular blocking has produced a reaction in that organ which we call a nephritis, or a cholecystitis, or a peptic ulcer, or even hardening of the arteries, according to the organ or tissue. Is that based on fact? If so, it is one of the most tragic things and one of the most remarkable things for us to consider as a dental profession to-day, for it puts us in a position of being not only guardians, but we are in the position of having the first opportunity of diagnosing conditions as soon as we see patients before they are seriously afflicted with these disorders. Let us take some heart infection as endocarditis. The latest histological and pathological work on etiology of heart valve infection indicates that the lesion is not caused by the organisms which were drifting through the blood stream and bathing the heart valve and clinging to it as they passed, but these organisms passing through a small blood vessel at the base of the valve and cutting off nutrition to the valve, and the little vessel ruptures, with granulations extending over the margin of the valve in consequence.

Let us take another instance, the modern conception of hardening of the arteries. When we come to study that from a histological and pathological standpoint we find it is not a hardening of the entire orifice, a hardening of the blood

vessel, but it is a series of discs, and each one of these discs has as its central point the beginning of calcification, due to a rupture in one of the capillary blood vessels surrounding the main artery, and which was caused by an embolus due to a drifting of the organisms in the system. We could go through a whole series of what we call the chronic disorders. We find that every one of them has as its first expression a blocking of a capillary.

Another significant thing, and I put it under four heads, is the fact that organisms have a selectivity for tissues, which is one of the greatest discoveries of modern times. Again, we have to thank Dr. Rosenow more than anyone else for the establishment of that fact. I will not attempt to go into details, because you are familiar with them. I will say this, however, that a certain strain of a given organism will have an appetite or an affinity for a particular kind of tissue and as it goes through the body it may or may not block. If it does not get a foothold it is because its appetite is not for that particular tissue. Therefore, a particular strain that produces an inflammatory process in a joint continues to do it so long as it is of the same strain and may pass through the liver or stomach, the arterioles and capillaries, and not produce a lesion because it has no affinity for that particular kind of tissue.

The next very important point is that the organism of a given species may change in type and specificity, so that it will to-day attack a heart valve or a knee joint. We may have a typical joint type of infection, and in a month from now the organisms may manifest an affinity for some other kind of tissue, or a year from now still another kind, so that we will have developing in the same patient four or five different expressions of disease from this one organism. Take with that the other thought I wish to mention—I will not undertake to establish it because it has been established, namely, these chronic disorders are largely the result of a focus of infection which may themselves be very slight, but there is a definite focus of infection in some part of the body, and of all districts of the body where a focus of infection is likely to occur the mouth seems to be universally the most common and the most frequent. Where does that put the dental profession to-day?

We find, as was expressed in the meeting I referred to, the medical profession are placing the question of diagnosis of an arthritis in the hands of the dental profession, which means that you will see these cases years and months before the physician, and the dental profession must learn to ob-

serve the first symptoms of enlargement of the joints, and immediately recognize the significance and look for the focus of infection, immediately eliminate it if possible, and save the patient from these grave joint disorders which come from a deforming arthritis, because after it has established itself with secondary foci in the joints, it is almost impossible to remove it, to correct it, and cure it, although the primary focus has been removed. Then it becomes necessary for the dentist not only to recognize arthritis, but to recognize the symptoms by questioning in regard to a large number of those chronic disorders from which people suffer before they are serious enough to have consulted their physicians about them. How are we going to do it? There is only one way, and that is to know the symptomatology of these chronic disorders. In the second place, we should know the pathology of their development, and, in the third place, we should know the relation of that pathology to the focus of infection and recognize and differentiate the various types of infection of the mouth and know which one is probably related to them. In my judgment, there is no question brought to the attention of the dental profession to-day that is more urgent than that of the problem of differentiation. I shall not refer particularly to the discussions of this afternoon, although they demonstrate it, but it is true that every discussion that I have heard for some time has brought up the question of septic infections without differentiating between the different types of infections, and without really having a basis for differentiation, for we have not yet the knowledge, and yet it is very clear that it will be possible in ten years from now. We will be able to differentiate the different types as we differentiate the degrees or types of infection of what we term pyorrhœa alveolaris, or whatever you choose to call it. The point I want to emphasize is that to get that information, and to do so as a dental profession, we must become students. I would like to go into the progress that has been made toward differentiating these infections, but I can hardly do so at this time. What has this got to do with this scientific research commission? There are enough eminent pathologists to study the great problems of pathology, and enough bacteriologists in the medical profession to solve the problems of bacteria in the mouth. What do we need special research for? We have only to look at the literature to-day to see that we need special dental pathologists and bacteriologists. How are we going to get them? We must train them. How are we going to train them? We must support them while they are

getting their training. We must give them an opportunity to get special information along our lines. The development of pathologists and bacteriologists is an example of what the Research Commission of the National Dental Association is undertaking to-day. This commission is composed of twenty-seven men, twenty-five of whom are elected by the trustees of the National Dental Association, and not more than two of whom come from any one state. Two of them are the president and secretary of the National Dental Association. This commission has an *ad interim* board known as the executive board of five, which carries on the active work of the commission. That commission is given the responsibility and opportunity of raising funds for carrying on research work, of organizing researches, of selecting men who are competent to undertake research work, and placing in their hands not money to pay them for doing research work, but money with which to hire technicians for enlarging their output, and to give them more hands to work with, more eyes to see with, and more fingers to manipulate with, to enlarge the number of men who are engrossed with work which they are doing through their own devotion, but whose limitations make it necessary for them to sacrifice their health to get out a small quantity of work.

The commission has also the responsibility of training research workers, and we are undertaking to-day to select men who will be ultimately competent, and in the meantime placing them in an environment where they will get such training as will eminently fit them for this work.

The dental profession will have by next September a metallurgical and electro-chemical engineer who will be available for all scientific metallurgical problems of our profession, who will devote his life to this work unless some big corporation succeeds in buying him away from us. That man is getting a salary of \$110.00 per month while doing our metallurgical research work, and the University of Michigan is going to grant him, Mr. Fahrenwald, the degree of Doctor of Philosophy for the work he is doing along the lines of metallurgy and chemistry. I want to say that kind of preparation is the only kind that we know of that will ultimately make a man large enough to solve these problems. Men who are compelled to work from morning till night to earn their bread and butter for their wives and children cannot work at night and do this research work to advantage. You know it cannot be done. We are taking up the subjects of bio-chemistry and biology, metallurgy, bacteriology and physiology, and I think ultimately, in five or

ten years, we will not have to go to the medical profession for competent men to work out these problems.

You are familiar with the work that has been done, for instance, by Dr. Hartzell. For those who are not familiar with his work, I will say that Dr. Hartzell last year had two men assisting him in studying the relations of mouth infections to arthritis particularly. This year he has three assistants, one simply a chief technician, another a dentist, working as an interne in the hospital, and a bacteriologist. But it is necessary for a man like him or any other man directing researches to have sufficient help to do the detail work so that he himself can direct a large quantity of it. You are all familiar with the fact that the work of Dr. Hartzell in relation to mouth infections has paralleled the excellent work of Dr. Rosenow, and has duplicated some of it from a particularly important dental aspect. I also want to state that Dr. Hartzell did that work under the advice of Dr. Rosenow, who was in conference with him. It was not simply the case of duplicating work, but it was developing the necessary dental phase of it. The effect of that work has been very beneficial. When Dr. Hartzell's work was demonstrated last year before the American Medical Association I had the privilege of having charge of the exhibit in the Scientific Exhibit of the A. M. A. Members of the American Medical Association looked at this exhibit, along with the others that we had, and said there was more in this one exhibit to show the medical profession what the dental profession can do than has been done by the Stomatological Section of the American Medical Association in the twenty years of its existence. (Applause.) I do not say that to belittle the work of the Stomatological Section, because I admire the men in that section and the work they have done. This exhibit made such an impression that it gave us a standing invitation hereafter to make a scientific exhibit.

I might take a good deal of your time in giving you the details as to the work that has been covered and the success accomplished by these different men, but I will only emphasize two or three new and important things.

I would like to call your attention first to the places in which the work is being carried on this year. I have spoken of the work done in the University of Minnesota, and the University of Minnesota hospitals and their medical staffs are giving us splendid co-operation. The president of that university is doing all he can to aid us so that our men may work to the limit of their capacity in carrying on these researches.

We are also carrying on splendid work in the University of Illinois under the direction of Dr. Fred. B. Noyes. There is no other guarantee necessary because of our confidence in his ability and in his work.

It is a matter of very great satisfaction to the commission that they have been able in a small way to strengthen the work of our adored father of the profession, Dr. G. V. Black. (Applause.)

The commission is also carrying on work in the University of Columbia.

The dentists of New York City and state have been giving splendid support to the work of Dr. Gies for some time, and our commission has united with them in support of his work. We hope to be able to enlarge the work.

The Research Commission is assisting Dr. Russel Bunting in the University of Michigan on the problem of dental caries, and Dr. Marcus Ward in the same institution on the study of cements.

The research department is giving support to the solving of metallurgical problems, and I think I am justified in telling you that one-third of the platinum used in the world is used in the practice and art of dentistry, and do you realize that for the dental profession it amounts to \$2,500,000 annually? If we would utilize the opportunity and the information we have on the tungsten product which has been developed through out Research Commission, it would result in great benefit and good to the dental profession. This metal is six times as strong as iridio-platinum; it has a melting point nearly twice as high as that of platinum; its elasticity is twice as great as that of steel. It has a hardness so much greater than that of steel that the management of the General Electric Company is responsible for the statement that one tungsten point will outwear two hundred steel points. It is a metal that does not lose its elasticity when you heat it. This metal is available for any man in this room for use in making posts for crowns and for casting bridges upon. It is so stiff and rigid that you can make a framework of it and cast about it and control the contraction that will take place in casting a bridge with its abutments, all at the same time. You may use it for orthodontia appliances either by the method which has been presented by Dr. Robinson or by the standard methods.

Relative to the application of the metal in orthodontia appliances, I am advised that it is destined to supplant largely the metals that are in use up to this time for orthodontic work. With its greater elasticity, you can make at-

tachments to it with hard gold solder. It has the property of enormous strength; it does not break off like clasp metal wires by crystallization. You may use wire that is so much smaller that it seems incredible for it to accomplish the work it does.

Any dentist who will write to the commission can get the metal. We are furnishing it to the profession at what it costs us to produce it, and ultimately the manufacturers will make it. The selling price is virtually one-sixth of that of platinum for the same weight.

In the last two or three months our research department has been able to furnish the profession enough tungsten to supplant the use of platinum to go far toward paying for the research expense that the commission has gone to for that particular line of research work. (Applause.)

There are only a few who know about it, because you have not read the recent issues of the *Journal of the National Dental Association* with reference to the research work we have been doing in regard to this metal.

As to palladium, it requires no special preparation. Any man can send to the American Platinum Works, New Jersey, and buy palladium for \$48 an ounce. You can get twice the bulk for the same weight that you can with platinum. You can make it equivalent to platinum at \$26 an ounce.

I might spend considerable time in detailing some of the work the Research Commission is doing with regard to these metals, but I shall not do so.

As to the progress that is being made in differentiating certain organisms and certain infections of the mouth, and particularly the problem that is paramount to-day as to whether or not the endameba is the etiological factor in pyorrhœa alveolaris, and whether emetin is a specific for this disease, I am in a rather embarrassing position in that I must refer to the researches I have been directing myself. In a word, let me say that there are four strong arguments in favor of the assumption that pyorrhœa is caused by an organism known as the endameba buccalis, and they are these:

1. The statement of bacteriologists who have national and international reputations.

2. The finding of that organism in large numbers, if not in a large proportion of the pyorrhœa pockets, meaning all pyorrhœa pockets from which there is pus in sufficient quantity to be seen with the eye.

3. The inference based upon the fact that since the amebic dysentery of the warm countries is caused by the ameba

histolyticus, and since that organism is destroyed and the disease cured by the injection of emetin, they have assumed by inference, let me repeat, that this infection of the mouth is caused by the *endameba buccalis*.

4. The testimony of a great many men who are using it.

I have given four arguments for, while there are over twelve almost unimpeachable arguments against those that have been advanced. It is rather significant that bacteriologists, with the exception of Dr. Barrett, who have made the bold and strong statement relative to the specificity of the *endameba buccalis*, have been working in a purely medical field. They are not dental bacteriologists and dental pathologists, so that over against my first argument we have still a large number of pathologists and bacteriologists from the dental profession who are not ready to assume that this organism is the cause. I will not enumerate the whole twelve arguments, but simply give the effect of them. The inference that *endameba* causes pyorrhœa, and since emetin cures amebic dysentery, it cures pyorrhœa, is met by this argument. If emetin has a beneficial effect in pyorrhœa treatment, it is not demonstrated at all that it is because of its effect on the *endameba*, because in the cases we have tabulated, and there are a large number, where the emetin has shown a beneficial effect. and where that treatment is started in December and January and continued into February and March, those pockets that did not show *endameba* when the lesion was first examined and during the early stages of the treatment with emetin. have an abundance of the organism after the spring months, even in March and April. That is a most formidable argument against the theory that the *endameba buccalis* is the sole cause of pyorrhœa alveolaris, because if emetin is going to be efficient as a remedy the *endamebae* must not increase in number. There is still another reason, and almost as certain and as important a bactericide as it is an amebicide for certain micro-organisms in the mouth, and this you can readily demonstrate for yourselves if you take half a dozen culture tubes and open them to the air and in two or three of them put a loopful of emetin to every five c.c. of culture media. Those test tubes that have no emetin will be cloudy in twenty-four hours from the bacteria that come in with the air. and those that have emetin will be clear.

We might consider the effect of emetin on the pathogenic organisms of the mouth, the typhoid bacillus, the colon bacillus, the diphtheria bacillus, a number of non-pathogenic organisms in the laboratory and hospital air, so that we are

not justified in assuming that if emetin is beneficial its good effect is due to its action on the endameba. The observations of the men who are making careful studies would seem to establish very clearly that the treatment with emetin is rarely beneficial further than the temporary abatement of the total quantity of pus flowing, and only largely beneficial in those cases in which there is an abundant flow of pus. Since emetin is only applicable, or beneficial in that type of case, what about the etiological factor that goes back of the time when the pocket was secreting pus?

The letters we have been receiving from various parts of the country are interesting and instructive. One of the most important functions of this commission will be and perhaps has been to establish a course of correspondence in various parts of the United States. At the present time, our research department has nearly two hundred and fifty correspondents as dental observers. We have the presidents of the various state societies, and from six to ten men selected in each state by the presidents of these state societies and the members of the commission. We have slides prepared for use from all parts of the country, from Canada, Mexico, South America, Porto Rico and Cuba, and it is interesting to find that the *endameba buccalis* is not present in all these communities universally, and it is not always present in the cases of *pyorrhœa alveolaris* which we see in Cleveland.

The correspondence of these men is significant because it shows the importance and skill of careful observation. For instance, one man writes that he has been using emetin for two weeks, during which time he has treated sixteen cases, and has had five absolute cures. (Laughter.) Another man writes that he has treated now sixty cases, with only one failure. Over and against that we have a larger mass of correspondence from men who are competent to judge, and the sentiment of the large bulk of them is to the effect that they have found practically no beneficial effect from the use of emetin unless instrumentation has been a part of the treatment. (Applause.) We find still another large group of men who say that emetin has apparently a definite beneficial effect which they cannot understand.

It would be interesting if we could take the time and analyze all of the replies that are favorable and unfavorable. In brief, only eleven per cent. of the replies received were favorable to the use of emetin; forty-seven per cent. were unfavorable, and forty-two per cent. were noncommittal.

Another important thing I want to emphasize is that emetin may have a very much greater significance for us eventually than the one that has been given. You are familiar with the fact, for instance, that when quinine is injected into the circulation of a patient who has malaria, it is a specific for that disease, and it kills the organism if it is injected at the right time. You are also familiar with the effect of salvarsan or what is known as 606. Here is one of the most profoundly significant things in the whole situation: Emetin apparently is but slightly injurious to the body itself, when injected in the quantities we may use. Its effect on certain bacteria that we know are pathogenic is simply marvelous. Those of you who are treating cases of pyorrhœa know that occasionally you will get a patient in whom you cannot treat more than half of the teeth in the mouth at one time without that patient having a severe reaction the next day. You will see it. If you undertook to scale all the teeth of such a patient at one sitting, that patient would be made profoundly sick the next day. Why? We use words sometimes to signify that which we do not know. One of them is that we say these patients are suffering from bacteriæmia. What do we mean by that? Do we mean the organisms have gone all through the blood, or do we mean the products of those organisms have gone through the blood, or do we mean that we have liberated certain forces of the body itself that have been able to split up proteins that constitute these bacteria, and by splitting them so rapidly our body is poisoned?

There are certain cases that respond to emetin treatment, not a large proportion of cases. This is precisely as certain cases respond to instrumentation. What takes place? From the observations we have made in our research work we have found that the injection of emetin causes an immediate change in the phagocytic power of the leucocytes. If you will take a microscope when you go home, and note one of these typical cases, you will find the leucocytes you take from a pus pocket before you use emetin, even without instrumentation, will show a given proportion, which will be a small number of ingested bacteria. If you inject emetin to-day and more after to-morrow, you will notice a more pronounced condition. You will find the phagocytes have taken up a larger number of bacteria. How do they do it? Metchnikoff gives us the wonderful and beautiful theory that the leucocytes gather up the bacteria by throwing out pseudo-pods. I have never seen them do it, although I have watched that process by the hour. A later theory of phago-

cytic action is that the leucocytes take in bacteria because of the sticking substances they have on their surfaces which hold the bacteria they come in contact with. The bacteria themselves have a sticky quality to their surfaces and what emetin seems to do is to produce in the blood that very quality. Note this parallelism; succinimid of mercury has been found to produce almost the same effect on pyorrhœa infection that emetin does, and that was found accidentally, and it produces the same reaction. It has been found that emetin seems to be almost a specific in many cases of the condition which we know as psoriasis, which has never been suggested as being an infection due to the ameba. Literature has accumulated rapidly to demonstrate that emetin has an action entirely apart from its amebicidal action, hence its beneficial effect in these cases.

We find in tabulating the temperature curve for November, December, January, February, March and April, that there was a definite relation, in Cleveland, at least, of the presence of endameba to the mean temperature, and frequently after there was a rise in temperature in January or February; the day after that rise we found spores in the mouth, and on the second and third days we find the motile organisms. A significant thing happened. After two or three of these series had followed, we wrote to one of our friends about it and he found the same parallel in his climate, though he had attributed it to less and more favorable cases. In Cleveland, at least, the presence of endameba seems to be very easily influenced in the winter months. It has been easy to understand why in New Orleans they can find the endameba all winter long in every mouth. When you get the next issue of the *National Dental Journal* you will find by the rise in the temperature curve there are twice as many endameba in mouths with no pyorrhœa in April as are found in mouths with pyorrhœa in January.

I am not going to point out to you the rest of the twelve arguments against amebic infection. I want to speak of one other important thing in this connection, and that is our responsibility in differentiating the various types of infection of the mouth. We are not justified, I think, in making a statement relative to the probable effect of an apical infection or gingival infection since the type of infection itself may vary through a very large range. When we get our microscopes and study carefully the type of organism in these cases or in others, we may find they are similar or the same, but, as a matter of fact, when we study the disease-producing effects of the organisms they are different, and

one of the most valuable ways is to study the same organisms as we get them from different pockets, with a motion picture. We may find it different. It has different motility. It has a different characteristic of motion according to the condition of the infection from which we have taken it. This will give us ultimately some distinct benefit in differentiating these infections.

I want to pass quickly to the group of organisms known as the streptococcus and pneumococcus group, assuming you are familiar with the facts that they have been demonstrated to be related to the rheumatic infections, such as inflammatory rheumatism of the joints, certain types of deforming arthritis, endocarditis, myocarditis and pericarditis, cholecystitis, peptic ulcer, and there are a few others we could name that have not been definitely related, but perhaps are.

I know of no better way than to give you the history in very brief form of the development of the symptoms in the patients themselves. In that way you may acquire information more quickly.

There are a series of affections, which may be infections, that are not classified as chronic disorders, expressing themselves as headaches, malaise, perhaps some digestive disturbance, more or less lassitude—those definite local symptoms which are related to the liver, to the stomach or to the nervous system.

I want to speak of that particular type that expresses itself as headache. We have not appreciated the fact that many people are subjected to a swarm of infections periodically. I believe we have demonstrated the fact that certain people who have recurrent headaches have at the time of these recurrences a swarm of infection by organisms. You may not be able to demonstrate them by taking a few drops of blood, because there are not enough of the organisms in the blood to be found in that way. The type that seems to be generally to blame will not grow in any artificial media we know of. The only way we have been able to grow it is in live rats and the patient's blood. This organism we call X, because we have never grown it on artificial media, and yet we find the organism in our motion picture films. It changes its morphology and rate of motility.

This particular type of infection seems to respond to emetin and also to the succinimid of mercury. What we are trying to do is to carry on that type of research work and be able to differentiate these infections of the body, and to do it we must have competent men. We must furnish microscopes and other things with which to carry on this work.

Lastly, what has the profession done to support the carrying on of this work? We have spent up to this time something like \$10,000. Last year we spent \$4,500, and this year we will spend approximately \$8,000. We have subscriptions now for \$49,000 and a little over. That amount has come to us almost gratuitously from the members of the dental profession as follows: \$2,400 from your splendid state; \$3,700 from Indiana; \$2,400 from Iowa; \$1,900 from Colorado; \$4,200 from Michigan; \$7,000 from New York State; \$11,900 from Ohio, and so on. (Applause.)

The question is, is it worth while? Surely it is, but it will cost you something if you say that. The method of carrying on the work is one of voluntary contribution. We expect ultimately to have a research institute of the National Dental Association, which institute will be competently endowed as are the Rockefeller or Carnegie institutions. We have already completed arrangements to secure a charter and have a board of directors selected.

The development of this research institute of necessity will be delayed by the war. Other great enterprises that were in process of consummation are utterly at a standstill because of the war conditions, and because the men who had promised to give their money expected to take it from their annual incomes and their incomes have been materially curtailed. We have some good promises which will doubtless be carried out after the war is over. In the meantime we are going on as a dental profession and are trying to work these problems out. There never was a time when the dental profession, if it so desires, could so well step into the breach and furnish information for the medical profession which will be received by that body with open arms, who will give us full credit for our place in the healing art. (Applause.)—*The Dental Review.*



Six Years of X-Ray in Dentistry

BY STEPHEN PALMER, D.D.S., Poughkeepsie, N.Y.

WHEN endeavoring to write a paper on any subject I feel with a certain author when he wrote, "You cannot make anybody else understand what you are writing until you know it yourself." And when endeavoring to write upon a subject of as much importance as the X-Ray, one realizes doubly the truth of the saying.

Every one in the dental profession who endeavors to keep up with the times by continually reading the dental journals and books of recent publication has the history of the Rontgen Ray well in mind, and thus only a short introduction will be given here.

Electricity is a so-called modern energy, and yet we forget that the philosophers of Greece bowed in veneration at the sound of the thunderbolt, and in Rome the ominous herald of the storm would silence the orator in the Forum. We could enumerate the meanings and attributes ascribed to the lightning flash, until we had written a lengthy and absorbing chapter from the pages of mythology. Thales, Theophrastus, Pliny, and other learned scientists, one after the other, continued the blazing of the way for knowledge, but not until 1590 did Sir Gilbert place the subject on a scientific basis, and although physician to Queen Elizabeth, he did not attempt to apply the knowledge thus gained to medicine.

From this period until 1895 such men as Lyden, Franklin, Salvani, Volta and Lord Kelvin had advanced the science of electricity, but it was left for William Conrad Rontgen to discover in that year the ray which now bears his name.

The Rontgen Ray, as applied to dentistry, was first suggested and advanced by Professor Koenig, at Frankfort-on-Maine, only a month after the discovery of the Ray, and now, twenty years later, we find dental radiography one of, if not *the*, subject attracting most attention in the profession. And rightfully it should, as it is the one agent that modern dentistry does, and future dentistry will, rely upon for perfecting many heretofore imperfect operations and treatments.

It is still the belief of many that it is not advisable, profitable or satisfactory for a dental practitioner to equip his office with an X-Ray outfit, yet the writer still holds to the

belief that it is the only way to make dental radiography a success, and believes that *the time is not far distant when every well equipped and modern office will have some kind of an X-Ray outfit*, and when these conditions prevail it will be used in seventy-five per cent. of the cases, while now fifteen is high for the cases that will visit a specialist after advised to do so. Thus in the majority of cases, where it is necessary and advantageous to both the operator and patient, it is not used.

It cannot be claimed for the X-Ray that it can take the place of other examinations, but, co-operating with other means, it assists the operator to accuracy, and often success, with a case that otherwise would be a failure. The X-Ray assists in a painless and accurate diagnosis, whereas with a probe there is a possibility of infection, pain, and, in the end, uncertainty.

To enumerate the many ways the Radiograph assists the dentist would be folly and would take up much valuable time. After about six years of experience with an X-Ray outfit in my office, I would not part with it under any condition, and after a trial of a few weeks I believe every one would agree with me that it is indispensable.

There are few towns or cities of a few thousand inhabitants where a medical practitioner cannot be secured to take a dental Radiograph, but experience has shown, in my home city, of thirty thousand, that such a condition is not satisfactory, the dental technique being so different from the medical.

A very slight detraction from accuracy in radiographing a root of a tooth will detract from the usefulness of the Radiograph. Therefore much special study and experience is required to make a success of it, and often a second and third radiograph taken from different angles is necessary. In that way only can many of the conditions be determined, and if the patient was continually referred back to a specialist the desired results would not be obtained.

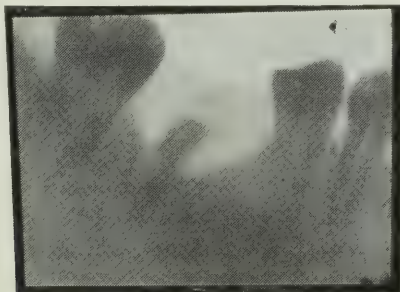


Figure 1.—This first slide shows a case of a root left

after extracting a molar, and when presented the gums were in a lacerated, swollen, and inflamed condition, making it uncertain to diagnose without a radiograph, but which, as you note, made location certain and removal easy.

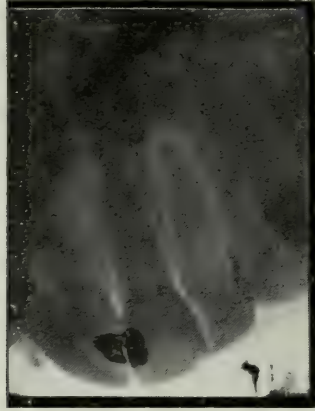


Figure 2.—This illustration shows an abscess at apex of the root of a lateral incisor, and also shows that the tooth had not been treated and root filled, making the procedure simple: You may say, why a radiograph? There are two reasons: (1) To show us the root had been filled, and if so with what success; (2) to show location of apex and area of abscess, to assist in amputation, which would have been the procedure if root had been previously filled.

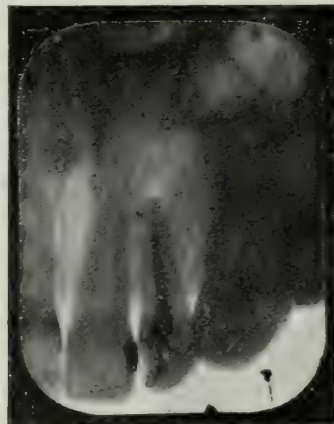


Figure 3.—A radiograph of a patient of a fellow-practitioner sent to me for X-Ray diagnosis after several failures of treatments. It shows how carefully the operation had been done and how successful the root filling was, yet still an abscessed area is shown. Advice was amputation, which was done successfully, and to-day the root is carrying a porcelain crown comfortably—crowned, on account of extreme discoloration.



Figure 4.—A similar condition of a crowned lateral, taken because of a discharge in the region of the extracted canine. This was diagnosed as coming from a remaining root, but the picture shows the origin of the abscess at the apex of the lateral, and the cause, a septic canal. Note the absence of root filling above the post of the crown: A sound canine sacrificed because the X-Ray was not taken advantage of.

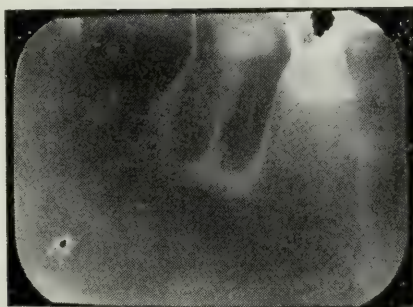


Figure 5.—A case with an enlargement on the left mandible, brought to me by a physician, his diagnosis being osteomyelitis. Upon examination I diagnosed it as an alveolar abscess at the roots of the twelve year molar. This did not prove satisfactory to the doctor, and this skiagraph was taken, which proved my correctness in the matter. The doctor asked me about treatment, and I stated that extraction of the roots and perhaps frequent syringings would be all that was necessary.

They left my office, and later the doctor returned and stated that in consultation with a surgeon they had decided it was advisable to operate, and asked me if I wanted to witness it. My answer was NO! and that if they operated on that patient it was because they wanted to and not because it was needed. A few days after the doctor called again to keep an appointment (which I thought he would not do after my remarks) and I asked what the results were, and he told me they had extracted the second molar, and also the third

molar (which was perfectly sound) and cureted the region thoroughly, and remarked, "The young man said he would give you a job as soon as his face was well." I answered him that he had better keep the young man away, as I might tell him what was on my mind, namely, that they had created a condition in the mouth that practically could not be corrected satisfactorily, but which was an ideal condition for replacement before the extraction of the third molar.

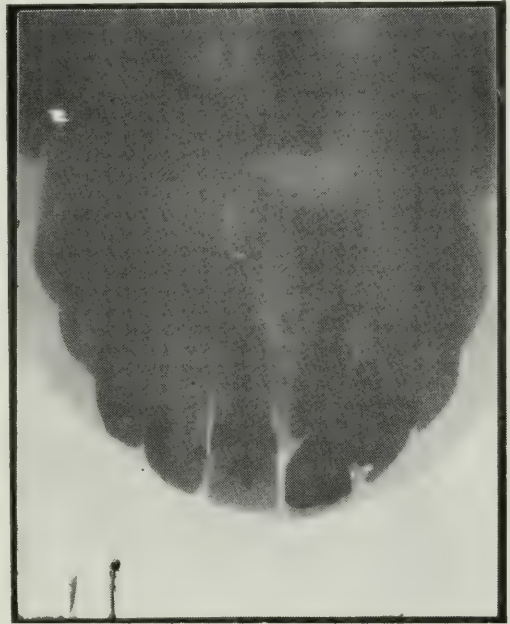
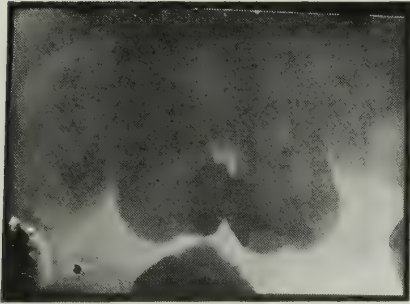


Figure 6.—A condition around a superior lateral, exuding of pus from the gingival margins, diagnosed as pyorrhœa, which this radiograph shows to be an abscess. Note also the pyorrhœal condition of the central incisor. If the lateral had been the only tooth involved it would have been diagnosed as an abscess undoubtedly, but as there were several teeth exhibiting pus pockets, it was natural to class this tooth with them until proven definitely by radiography.



Figure 7.—In this picture you will note an abscess at the apex of both the first and second bicuspid superior. Treatment was commenced with the second bicuspid, which was apparently the only one that was causing the trouble. After a few treatments without any noticeable improvement this skiagraph was taken, which brought to light the second abscess or an extension to the first bicuspid, which by removal of the crown and treatments soon became aseptic.

Without the skiagraph in this case treatment would have been unsuccessful.



Figures 8 and 9.—These slides are of a case presented, with all the discouraging history one could care to hear.

A woman, much depreciated in health, appetite gone, nights sleepless, losing flesh, and in fact tired of life herself (and the family almost so), had been doctoring for almost everything. She had visited dentists, but with very little temporary relief or none at all. Case was brought to me by her husband and both vowed they would not leave the office until the left superior first molar was extracted. Upon examination I found a simple pulp exposure, which I felt confident an application of creosote would relieve, but with all my arguments they finally gained the day and the tooth was removed (an act which has been much regretted by me since, yet without doing it I would not have had the opportunity to present the case to you to-night). After the extraction, relief was only temporary, and the patient returned. A diagnosis was that the trouble came from a long standing abscess with fistula under a right central dummy of a small bridge, which radiograph shows, came from a small root. This was extracted and relief followed for a time, when the trouble returned in the left inferior region and the second radiograph taken as shown, with the abscess at the apex of the second molar. The tooth was opened and condition again relieved, but in a few weeks the same condition presented in the right inferior region. A third radiograph was taken, the tooth opened and treated successfully. The patient has been gaining in every way, and now con-

siders life worth living, and for nearly three years has had perfect health.

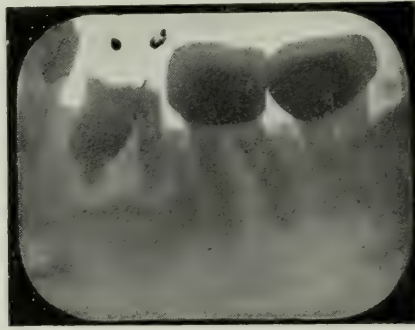


Figure 10.—Illustrates an inferior molar root from which a gold crown was removed in the expectation of treating the root and re-crowning. This condition was found, showing the abscess, and around the posterior root an excess of gutta percha which had been forced in when the roots had been filled.



Figure 11.—Shows a condition found around the inferior first molar, and second bicuspid, which owing to pyorrhœal conditions in other parts of the mouth was diagnosed as such, until this radiograph convinced us it was an alveolar abscess, discharging at the gingival margins.



Figure 12.—Shows the extrame local condition of a lower

lateral in the mouth of a young lady of eighteen years. It is doubtful of successful results, as supporting bone is entirely destroyed.

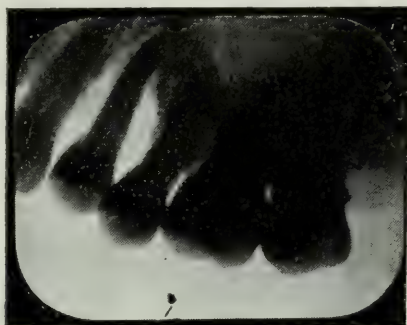
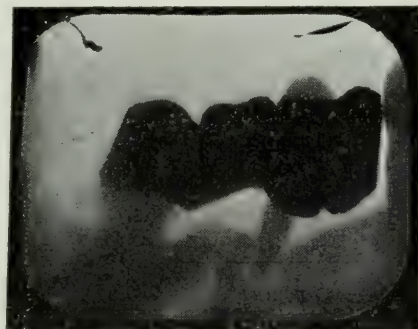


Figure 13.—A similar condition as Figure 12, of a superior bicuspid, but more encouraging condition and results from treatment more satisfactory.



Figures 14 and 15.—Show two small bicuspid roots which were endeavoring to support bridges but failed, showing that in the question of strength of support for crown and bridge work the radiograph is called to assist us.



Figure 16.—This is one of three exposures to locate the two superior and the left inferior wisdom teeth, which seemingly were causing neuralgia, but much to our surprise all the radiographs failed to show a tooth, and the trouble must be from some other source. The right inferior wisdom is erupted normally.

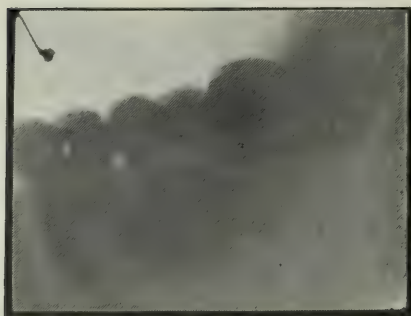


Figure 17.—This slide shows a condition we often find. An inferior third molar, partially erupted, and causing much discomfort. Requested its removal, and (as the picture shows) it was fortunate for all concerned that X-Ray was taken. The tooth, with roots pointing directly back in the angle of the jaw, would without the picture have been almost impossible to remove, but, with it, operation was successful.



Figure 18.—Shows one of the two radiographs taken of the same mouth, locating both inferior molars impacted.



Figure 19.—This shows a condition we are often called to correct, mal-occlusion and irregularity in the canine region, and a desire for uniformity when the opposite canine

is erupted normally. It shows a missing canine which, after the separation of the lateral and first bicuspid, will erupt.

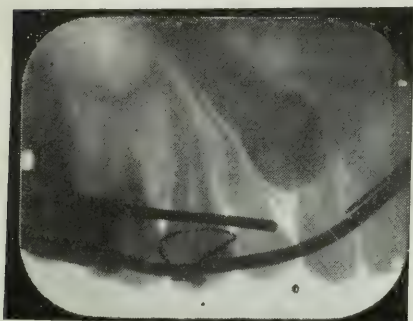


Figure 20.—A dental radiograph taken to determine the presence of a non-erupted canine and second bicuspid of the left superior region, after their absence had been previously declared by plate radiographs of the face, thus proving the superiority of small film for dental use.

Figure 21.—Shows the condition of impaction and non-eruption of the right superior central, lateral, and canine, caused, as far as can tell, by a fall when about five or six years of age, and hitting two temporary teeth on a stone step, knocking them back in the arch, but not out, and nothing being done until five or six years after, when this condition was found.

In this case we have the age to our advantage, and also an almost normal arch otherwise. At the end of about a year's treatment the lateral was erupted about a third and the central was just coming through the gum well under the lip.



Figure 22.—Shows two non-erupted superior canines, which after expansion of the arch, and the removal of the temporary teeth are coming into place.



Figure 23.—Is a similar view of the cousin of the preceding case and very similar in regard to location of the two canines, but the mouth generally is in a more normal condition and the patient of a more favorable age for treatment.



Figure 24.—This is a radiograph of a college student, her home in India. Doing some work for her, a fistula was discovered over the left superior lateral, and she stated that several years ago her father, a medical missionary, attempted to extract the lateral, but failed, and the abscess with the fistula was the result. The tooth was opened, and as it did not respond to treatment promptly the skiagraph was secured, which showed the abscess, also the non-erupted canine, which was missing, but which we were not looking for. You will note the pus from the lateral followed along the canine and penetrated the antrum. Every morning for years she had felt a dripping in her throat, which specialists

had endeavored to cure but without result. This was a time when the X-Ray got me into a difficult case, as she requested me to remove the tooth. This was done, however, under nitrous oxide and oxygen anæsthesia, and the results were the curing of the trouble in the throat, and a personal satisfaction worth the cost of the outfit.

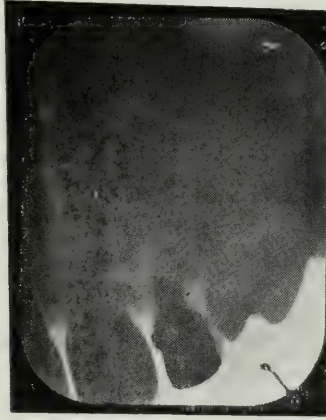


Figure 25.—We note in this picture the presence of a non-erupted canine above a temporary lateral, which has a porcelain crown attached. The diagnosis, until this radiograph was taken, was a blind abscess on the lateral, as the appearances above the lateral would give that impression.



Figure 26.—A radiograph taken after an operator had endeavored to cure a pus discharge which was supposed to come from a piece of root left when the first molar was extracted. Continued attempts had been made to remove a small piece of root which this illustration shows did not exist. The skiagraph shows a septic nerve canal in an apparently sound bicuspid and a pus pocket at the side of the root, which upon opening and treatment relieved the condition. If the radiograph had been resorted to at the beginning, what suffering and inconvenience would have been saved? Would not this have been done if the practitioner had been the possessor of an X-Ray outfit?

Quarterly Report-Canadian Army Dental Corps.

THROUGH the courtesy of Major A. A. Smith, Acting Chief Dental Surgeon, Canadian Army Dental Corps, ORAL HEALTH publishes herewith a report of the amount of work accomplished by the C. A. D. C. in Canada in the Mobilization Camp Dental Clinics for the months of July, August and September, 1915.

Number of fillings inserted	15,844
Number of treatments	5,703
Number of dentures (Sept. only)	328
Prophylaxis treatments	1,225
Extractions	11,364
Emergency cases	650

Total operations	35,114
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Do your Bit! ***The Canadian Army Dental Fund***

TOTAL subscriptions to this fund have now reached the sum of \$2,335.13, to 27th October, 1915, made up as follows:—

Last report in ORAL HEALTH	\$2,295.15
Dr. A. W. Ellis, Toronto	10.00
Dr. Margaret Gordon, Toronto	5.00
Dr. C. S. Williams, Toronto	5.00
Dr. P. P. Wimm, Alvinston	10.00
Dr. R. R. Walker, Bolton	5.00
Dr. W. J. Loftus, St. Catharines	5.00

\$2,335.13

This fund is being administered in the interests of the members of the Canadian Army Dental Corps. Heavy demands have already been made upon the fund, and it is hoped that every dentist in Canada will do his "bit" and make this fund in every way worthy of the C. A. D. C. and the profession of dentistry.

All subscriptions will be acknowledged through the dental journals and will be received through your local society or committee or by the General Treasurer, Doctor C. V. Snelgrove, 105 Carlton St., Toronto.

Toronto Dental Society

THE Executive of the Toronto Dental Society announces a programme of very special merit for the season 1915-16.

On November 15th, Dr. Chas. F. Ash, of New York, will give a paper on "Removable Bridgework." Dr. Ash needs no introduction. His work is too well known to be further eulogized. Dr. A. A. Stewart will open the discussion and will be followed by Drs. R. G. McLean and J. Lowe Young.

Dr. J. Lowe Young, also of New York, whom the Society heard with such lasting profit a few seasons ago, is coming to Toronto with Dr. Ash and has consented to give a Lantern Talk to the members of the Society, entitled "Four Years After." Dr. Young would like the members to bring plaster casts of cases in which they have placed large gold inlay restorations so that he may see what we are doing in Toronto.

The initial meeting will thus be in the nature of a "Double-Header." This will necessitate an afternoon session at 4 o'clock, followed by the regular dinner and the evening session at 8 o'clock.

Dr. W. E. Cummer will take the meeting of December 6th, and will read a paper on "Partial Dentures." This paper has been specially prepared for the annual meeting of The Virginia State Dental Society, and will be presented to our Society almost immediately after.

Dr. Thomas L. Gilmer, of Chicago, will be present on January 17th, and his paper will be along the line of "General Disturbances from Periapical Infection."

Dr. Leon Williams, whose great work on anatomical tooth form for artificial teeth is so well known, will be the guest for March.

The meetings will be held, as usual, at the Carls-Rite Hotel. Dinner will be served at six-thirty.

The Ontario Oral Hygiene Conference

RECENT events both in army and civilian life have shown that the Oral Hygiene movement has gained such an impetus that it can not now be arrested.

To be held Tuesday, December 7th, 1915.

Therefore, the main effort of those interested in the movement is to guide it in the proper direction, so that the least

mistakes may be made in attaining as near perfection as possible. Naturally with so many different communities dealing with the subject, there must of necessity be various opinions as to ideal methods.

In discussing the question of dental clinics for children, we find that in Boston, with its large Forsyth Institute, the method of Centralization of the Dental Clinic has been adopted, and the directors seem to be quite satisfied with their system. On the other hand, in Toronto, instead of one large centralized clinic, we have a number of clinics situated in public schools and other buildings. In Toronto, these localized clinics appear to us to have many advantages over the centralized clinic.

The main feature of the Conference this year will be a discussion of this question. Dr. Harold DeW. Cross, Director of the Forsyth Institute of Boston, will give a paper on the Advantages of the Centralized Clinic. Dr. W. W. Belcher of Rochester, editor of "Oral Hygiene," in whose city a large amount of money is being expended on a centralized clinic, will be present to discuss the subject. Buffalo also is considering the question of clinics, and Dr. J. Wright Beach will be present in the interests of Buffalo.

Dr. Wallace Seccombe, Chief Dental Officer of the Medical Inspection Department of the Board of Education, Toronto, will present a paper upon the subject of School Dental Clinics, with special reference to the plan of organization followed in Toronto.

A matter of great interest will be an inspection of the large Technical School (just opened in Toronto) by the delegates to the Conference. This Technical School is the last word on the subject, and a visit to it will no doubt be much appreciated.

There will also be visits made to the Dental Departments lately established in the principal hospitals in Toronto, as well as to some of the Public School clinics. In the evening, as last year, there will be a dinner to the delegates, after which the discussions of the Conference will occur.

The Conference will be held on Tuesday, December 7th. As in previous years, the delegates will meet at the Dental College Building, corner College and Huron Streets, Toronto. The Committee will provide automobiles, which will leave the College at 10.30 in the morning to take the delegates on a round of inspection.

On the previous evening, that is, Monday, December 6th, the Toronto Dental Society will hold its monthly meeting. On that evening Dr. W. E. Cummer is to give a paper

on "Partial Dentures—Removable Bridgework." The Toronto Dental Society gives a cordial invitation to the delegates of the Oral Hygiene Conference to be present for the evening. The Toronto Society will meet for dinner on Monday at 6.30, at the Carls-Rite Hotel.

Summary of Dental Laws of Canadian Provinces

THE following summary of facts concerning the official organizations and dental laws of the several provinces of the Dominion will, it is hoped, prove of value for future reference. The material was prepared by the late Doctor J. B. Willmott and but for a few minor changes is now published exactly as it left his hand.

A FEW FACTS WE SHOULD KNOW ABOUT ALL THE PROVINCES.

- 1st. The proper legal title of the dental corporation.
- 2nd. The proper legal title of the governing body.
- 3rd. Who may legally practice dentistry.
- 4th. Who may be examined for a license to practice.
- 5th. Who may register without examination.
- 6th. Is registration permanent or annual?

British Columbia.—Secretary, A. T. Minogue, 510 Granville St., Vancouver.

1. The College of Dental Surgeons of British Columbia.
2. The "Council."
3. Those whose names are on the register for current year.
4. Local indentured students; graduates of Canadian and British Colleges; graduates of American Colleges which have the required preliminary education.
5. None.
6. Annual; conditional on payment of annual fee of \$10.

Alberta.—Secretary, James McPherson, Edmonton.

1. The Alberta Dental Association.
2. Board of Directors.
3. Those whose names are on the register for current year.
4. Local indentured students—graduates of Canadian, British and of recognized American Colleges.
5. Holders of D.D.C. certificates.
6. Annual; fee, \$5.00.

In Alberta the dental examinations are conducted by the University of Alberta.

Saskatchewan.—Secretary, L. J. D. Fasken, Regina, Sask.

1. The College of Dental Surgeons of Saskatchewan.
2. "Dental Council."
3. Those on register for current year.
4. Local indentured students; graduates of Canadian, British and recognized American Colleges.
5. Holders of D.D.C. certificates.
6. Annual; fee, \$2.00.

Manitoba.—Secretary, D. Norman Ross, M.D., 482 Main St., Winnipeg, Man.

1. Manitoba Dental Association.
2. Board of Directors.
3. Those whose names are on the register for the current year.
4. Local indentured students; graduates of Canadian and British Colleges.
5. Holders of D.D.C. certificates.
6. Annual; fee, \$2.00.

Ontario.—Secretary, W. E. Willmott, 96 College St., Toronto.

1. Royal College of Dental Surgeons of Ontario.
2. Board of Directors.
3. Members of the R.C.D.S. of Ontario.
4. Those who have complied with the curriculum of the R.C.D.S.
5. Holders of the D.D.C. certificate.
6. Permanent. There is an annual fee of \$2.00.

Quebec.—Secretary, Eudore Dubeau, Laval University, Dent. Dept., Montreal.

1. The College of Dental Surgeons of the Province of Quebec.
2. Board of Governors.
3. Licentiates whose annual fee is paid.
4. Only those who have complied with the whole curriculum in Quebec.
5. None.
6. Permanent.

New Brunswick.—F. A. Godson, Secretary, St. Johns, N.B.

1. The New Brunswick Dental Society.
2. Dental Council.
3. Those whose names are on the register.
4. Local indentured students and graduates of recognized Dental Colleges who have the required preliminary education.
5. Holders of D.D.C. certificates.
6. Annual; fee from \$1.00 to \$3.00.

Nova Scotia.—Secretary, George K. Thomson, Halifax, N.S.

1. Dental Association of the Province of Nova Scotia.
2. Provincial Dental Board.
3. Those whose names are on the register.
4. Local students; graduates of Dental Colleges who have complied with all the requirements of the Provincial Dental Board.
5. Holders of the D.D.C. certificate.
6. Permanent.

Prince Edward Island.—Secretary, J. S. Bagnal, Charlottetown, P.E.I.

1. Dental Society of Prince Edward Island.
 2. The Council.
 3. Those whose names are on the register.
 4. Local students; graduates of recognized Dental Colleges who have complied with all the requirements of the Council.
 5. Holders of D.D.C. certificates.
 6. Permanent.
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DENTISTRY IN THE GERMAN ARMY.—In view of the suggestion that has been made that an Army Dental Corps should be formed for inspecting and treating the teeth of British soldiers, it is not without interest (says the *Glasgow Herald* London correspondent) to note that the German Army has been well supplied with dentists from the beginning of the war, and that their work has been found so useful that it has been deemed wise to increase their number and to summon the students of dentistry from the troops among whom they had been distributed, in order that they may practise dental work. In addition to this, the Army doctors are provided with assistants skilled in dentistry for the special purpose of attending to wounds of the jaws. It has also been found that officers and men break their artificial teeth more frequently than in peace times. On certain days some of the dentists from the base hospitals, equipped with all the necessary appliances, go to the front to undertake the necessary repair operations.—*British Dental Journal*.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

MOUTH INFECTIONS.

FEW subjects have received more attention from members of both dental and medical professions than that of the relation of the oral cavity to general systemic infections. There is always, when dealing with new methods of treatment, a tendency on the part of a few to carry their views to extremes and in the heat of enthusiasm to suggest remedial measures which in themselves are sometimes more harmful than the original complaint. For instance, many well-meaning physicians and possibly a few dentists have of late come out openly with the suggestion that all devitalized teeth ought to be extracted because of the fact that, in their opinion, there is danger of infection from teeth whose root canals have been filled even with a great degree of skill. These self-appointed and misled reformers are doing an incalculable amount of harm to the cause of dentistry. As Dr. C. N. Johnson says (*Cosmos*), "there are relatively fewer artificial teeth worn to-day than there were years ago. "Why? Mostly, it is due to the fact that it has been possible to treat and save pulpless teeth."

Within recent times the question of systemic infections and their relation to the oral cavity has become a much discussed one. Extremists have come forward and sought to relate every possible pathological condition to imperfections in the oral cavity. One considers it a real treat nowadays to hear an expression of opinion on this subject which is at once clear and comprehensive, yet devoid of those far-fetched opinions so characteristic of those who have given insufficient thought to a subject of such vital importance to dentists. To those seeking just such a diversion, Dr. P. G. Putterbaugh's paper, read before the South Dakota's State Dental Society (*Pacific Dental Gazette*) is recommended. The author points out that whereas "for many years all "inflammatory conditions of the mouth were considered to "be purely local entities"—now it is found "that local areas "of suppuration are frequently associated with grave path-

“ologic processes encountered in the field of internal medicine.” An urgent plea is made that students in dentistry be given greater scope for the study of anatomy and pathology.

Particular attention is given by the author to the consideration, both as regards symptoms and treatment, of the following infections, so frequently met with in the mouth: Catarrhal, aphthous, ulcerative, gangrenous, mercurial, leukemia; and thrush. Dr. Putterbaugh points out that “no other part of the body offers conditions so favorable to bacterial growth, than does the mouth. The poisoning of the oral cavity by putrefactive conditions is not restricted to purely local symptoms.” Medical men ought not to be allowed to usurp the position properly belonging to dentists, yet we find them “stepping in and studying mouth conditions as they have never been studied before.”

In concluding his very instructive paper, the author makes two statements which emphasize the seriousness with which the dentist should view his responsibilities when treating mouth infections: “In mouth infections the toxic material drains into the lymphatics of the neck, and these in turn empty into the sub-clavian veins, throwing the infection directly into the blood stream. From the sub-clavian veins it passes on to the innominate veins and superior vena cava to the heart; from the heart to the lungs, and from the lungs to the left side of the heart and into the systemic circulation.” Here then we have the possible source of endocarditis or pulmonary tuberculosis.

Again, “I believe that practically all ulcerative conditions need systemic regulation just as much as they need local treatment; and if dentists will study a little more of general medicine, and physicians will study a little more of dentistry our patients will receive better care than they possibly could without our mutual co-operation.”

ROOT CANAL TREATMENTS.

Since the advent of the X-Ray in dentistry, the question of root canal filling materials and dressings has become very prominent. The impossibility of absolutely filling all root canals has long been recognized. Some dentists, happily only a few, and many physicians are advocating the extraction of all teeth from which the pulp has been removed, because, as they claim, the area about the foramina is a possible source of infection. Undoubtedly much evidence might be submitted to substantiate such a claim, yet the weight of opinion is against such a radical method of treatment.

Dr. Grieves (*Cosmos*) warns dentists against using ar-

senic too freely when devitalizing the pulp. He says, "from the study of an increasing library of radiographs, we are convinced that there is a greater proportion showing rarefied apical areas, particularly about good canal fillings, produced by arsenic—often before the filling is placed—than from liquefaction from after-infection." The author further points out that in accordance with the "latest thought and practice in surgery—that as few cells be destroyed as possible" it is not good practice for a dentist to make "continued application of strong formaldehyde preparations, phenol, cresol, trichloroacetic acid, zinc chlorid and a host of germicidal agents in too high percentage, placed too high in the root."

In the opinion of Dr. Grieves the three chief dangers of root canal treatments are: first, "the production of a minute periapical tissue necrosis, of which the operator is not aware; second, infection of that area, which has lost its resistance by his processes; or third, if he succeeds in closing it without infection, the final arrival, by hematogenous convoy, of micro-organisms, often of the non-virulent type, which may lodge there, become adapted and raised in virulence and propagate so rapidly as to form a really dangerous infective radius."

Having pointed out the dangers of root canal treatments, the author proceeds to explain methods by which undesirable results may be avoided. He suggests: (1) "The surgical removal of the dental pulp, (2) the discontinuance of the use of arsenic, except in unusual cases—then to be applied, not to the pulp, but to some sensitive spot in the dentine, for a short time, so that by slow absorption only the coronal pulp may be affected; (3) the apical third of all pulps be removed surgically, as far as possible; (4) allow the immediate cemental foramina, containing blood-clot tissue, detritus and exudate, to drain in the presence of mild iodine solutions, iodoform, or a weak formalin solution, which has been pumped into the field and carefully sealed there away from saliva; (5) remove the foramina contents."

Much difficulty is experienced in filling small root canals. To overcome this Dr. J. P. Buckley (*Dental Review*) suggests that, instead of the old fashioned acid and soda methods, a paste of sodium dioxide and absolute alcohol be placed in the pulp chamber over the small canals—this paste to be worked down the canals as far as possible with a smooth broach. The alcohol soon evaporates. Moisten the sodium dioxide which remains with water. This causes its decom-

position (oxygen and caustic soda). Neutralization of the soda is obtained by using a weak solution of sulphuric acid (two per cent.). This method is recommended by Dr. Buckley in preference to that of pressure anæsthesia where only remnants of the pulp remain.

Another means of handling fine tortuous canals is given by Dr. N. C. Hessler (*Dental Summary*). In drying out the canals Dr. Hessler uses warm air and alcohol, supplementing this with the use of absorbent paper points. His idea is to get the canals as dry as possible, "because we expect to carry the sealing material to place by capillary attraction or diffusion." Where the root canal divides into "two or three little auxiliary foramina besides the main canal," an effort is made to remove the water of composition. "Take a fine "broach with a few fibres of cotton wound round it and "pump a rosin solution into each canal (12 grains of rosin "to 3 drams of chloroform). Now apply some eucapercha "compound to canal or canals and insert a gutta percha "point."

The question of sterilization of root canal instruments is taken up by Dr. A. P. Lee (*Cosmos*). He suggests the use of pulp extractors fitted into aluminum handles. These are boiled and kept in test tubes containing a 50 per cent. alcoholic solution of lysol. Reamers, drills, etc., are similarly treated. Broaches and canal pluggers are boiled, dried and passed through a Bunsen flame just previous to using.

PRESSURE ANAESTHESIA.

The use of pressure anæsthesia is rapidly growing in favor with dental surgeons the world over. As a time-saver it commends itself to all who wish to work quickly and effectively. The practice of pressure anæsthesia is, however, not unattended with danger. Where cocaine is used toxic effects may be evidenced quite suddenly and unexpectedly. It is well, then, to be prepared for all contingencies. Dr. W. H. R. Grant (*Commonwealth Review*) emphasizes this point by relating his own experience when using pressure anæsthesia with cocaine. Being unable to produce good effect with the initial application of the drug, he increased the amount until, as he says, "I was using a solution probably from 20 to "30 per cent. of cocain," and (this is worthy of emphasis), "injecting it into the patient through a deeply implanted "needle, i.e., the apex of the tooth. Of course a comparatively small proportion of the solution got through the "apical foramin, but in this case it proved too much."

ANALGESIA.

A widely advertised method by which the preparation of

sensitive cavities, and other operations of like character, could be performed on a conscious patient without causing pain, seems to have run its course. Like many other innovations in the sphere of dental activity (not forgetting emetine and like preparations) too much merit was attached to it before time and experience demonstrated its impracticability.

Dr. C. N. Johnson, than whom there is no one better qualified to pass judgment, says of this, "the practice of "analgesia with nitrous oxide and oxygen did not appeal to "me as a routine and regular method of procedure in filling "teeth. Whilst seeing virtue in a method which has for its "aim the amelioration of suffering during dental opera- "tions," yet he is of the opinion "that the general intro- "duction of analgesia for the ordinary operations which we "perform each day, such as cavity preparation, trimming "roots for crowns, etc., would do infinitely more harm than "good." Dr. Johnson bases his objection on the following: "(1) The impracticability of the process—after these years "of testing out, if it were practicable it would be used more "to-day instead of less; (2) its possible detrimental effects "on the patient—when patients are kept practically under "the influence of an anæsthesia for a sufficient time to per- "mit of cavity preparation or similar operations, and when "this is done as a routine practice, it is difficult to estimate "the injury that may result." "There is another factor, "not usually considered, viz., the possible effect on those "patients whose blood pressure is high"; (3) "the danger "of approaching too close to the pulp in cavity prepara- "tions—small cavities where there would be no danger of "exposing the pulp if analgesia had not been used"; (4) "its demoralizing influence upon the stamina of the pa- "tient"—"in most of the routine work of dentistry the pain "need not be so great that it works an injury to the patient— "the lure of this practice (analgesia) held out to people will "in many instances tend to minimize their self-control, and "unfit them for meeting some of the other emergencies of life."—*Dental Cosmos*.

CHOOSING THE ANAESTHETIC FOR BRIEF OPERATIONS.

It has become almost an axiom in dentistry that the best local anæsthetic is nova-caine and the best general anæsthetic nitrous oxide and oxygen. This rule, like so many others, is subject to modification. Dr. Dudley W. Buxton discusses this in an article written for the *British Journal of Dental Science*. He says in part: "For short operations, the person administering the anæsthetic is bound to limit his choice

of an anæsthetic agent, and methods of its use, so as to avoid material risk." Thus, if a tooth has to be removed, he would not be justified, in ordinary circumstances, in giving chloroform, provided nitrous oxide gas or ether is obtainable, because"—"chloroform is more dangerous than either nitrous oxide or ether. However, the condition of the patient may be such that a relatively safe anæsthetic may in his case be supremely dangerous, far more than an anæsthetic which is in itself less safe than others. To illustrate this point: if to a patient who suffers from respiratory difficulty"—"nitrous oxide is given, it will increase the dyspnoea by causing venous engorgement, and may produce spasm of the larynx or asphyxia, whereas the use of chloroform would avoid these dangers."

Another point well worthy of mention as illustrating the dangers of lack of skill in administering anæsthetics, is that of blood pressure and its relation to anæsthesia. Dr. Buxton refers to this as follows: "Many persons suffer from a greatly increased blood pressure, a condition commonly associated with a diseased state of the arteries—arteriosclerosis—and if an anæsthetic such as nitrous oxide or ether is employed, the blood pressure will be still further increased, with the result that an artery in the brain may rupture, since in this area of the circulation the blood vessels are thinly walled and are not supported by the surrounding tissues. Here again chloroform, since it lowers blood pressure, would probably be safer for the patient."

This expression of opinion carries with it not only a warning against the indiscriminate use of anæsthetics, but also a demand for the broader education of dental students along lines which will enable them to understand better, general systemic rather than purely local conditions.

Obituary

CHARLES WESLEY BROWN, D.D.S., who graduated from the Royal College of Dental Surgeons, 1909, and practiced in Toronto, died 1st November, 1915, at Edmonton, Alta., following a prolonged illness.

ACTIVE SERVICE ROLL

of Graduate and Undergraduate Canadian Dentists

Complimentary Copies of Oral Health will be sent during the progress of the war to all those on active service whose army address is known.

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†Acting Chief Dental Surgeon, address, Ottawa.

*Lieutenants rank as Captains while overseas.

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MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

RUBBER BOWLS.—If the upper part of rubber bulb of your chip blower wears out, cut the lower half off, which makes an ideal plaster bowl for small work, such as inlays and small bridges.—*H. E. Blilew, D.D.S., Chicago, Ill. (Dental Review).*

TO RELIEVE PLATE CAUSING IRRITATION.—While the irritated spot on the membrane is readily seen, it is not always easy to locate it on the plate, especially the lower plate. Moisten a little whiting on palm of the hand, take a very little on a spatula, and apply to the irritated spot, place the plate in place, and on removing it will be readily seen. Use small carborundum to remove.—*L. P. Haskell, D.D.S., Chicago, Ill. (Dental Review).*

MELTING ALUMINUM.—In melting aluminum previous to casting, new clean ingots should always be used. The metal should never be overheated, and when fusing it should be slightly agitated with the end of an ordinary slate pencil from time to time, and all dross removed, until a smooth, clean surface presents, after which the casting should be made, observing only moderate speed in doing so, as the metal remains liquid for some moments.—*H. J. Goslee, Dental Review.*

EXTRACTION OF THIRD MOLARS.—Third molars with no occlusion should be removed, providing there is a full complement of teeth in the mouth, and no loss of teeth anterior to the third molars, to prevent the second molars from decaying. I have observed these conditions in mouths and find that there are few patients where the third molars are thoroughly brushed, and on removal find that the contact of the third to the second molar has usually started to decay. So, by extraction, we eliminate decay by enabling the patient to brush the distal of the second molar and keep that area clean. If we believe in prophylaxis, why should we leave the unclean third molar in the mouth to destroy the second molar beyond restoration?—*A. Brom Allen, D.D.S., Chicago, Ill. (Dental Review).*

ORAL HEALTH

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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. 5

TORONTO, NOVEMBER, 1915

No. 11

EDITORIAL

The School Lunch

THE value of a child to the state is being more and more fully realized. The wealth of a state depends upon the character of its citizens. The future progress and attainment of a community depends largely upon the moral, mental, and physical development of the child of to-day. "Child welfare" thus becomes one of the most important questions with which our public men have to deal.

The time has gone forever when it may be said that the whole duty of the state toward the child has been accomplished when the child has been merely given a mental training. Education has come to mean something more than school attendance. There are those who have attended only the world's school of observation, study and experience,—self-educated persons who are among the most valuable members of society. Modern educational systems are judged by their ability to teach boys and girls the underlying principles of correct living, and educational methods should be of a character to lead pupils to acquire good habits and prepare them for a useful life of service.

The mental and physical development of a child cannot

be disassociated. Indeed, they are interdependent, the one being the complement of the other. Thus it is that in modern schools provision is made for the physical as well as the intellectual attainment of each child. Both hereditary and environmental influences are being combated where these militate against the best physical development, and this is well, for, whatever may be said of present day life, it is certainly strenuous. One has to either move at the pace or step out of line. Physical strength and force thus become essential factors in modern success. The influence and uplift of many lives are lost to the world because of individual lack of physical stamina and endurance. Our schools must seek to develop the whole child, and prepare it to take its place as a useful member of society.

Medical and dental examination of school children, and free service for children of the poor, are a natural and logical outcome of a recognition of the value to the individual of a sound healthy body and of the value of the citizen to the state. This service is not *charity* but the *right* of every child. Where the parent is unable to supply necessary medical and dental service, it is clearly the duty of the state to see that the child is not allowed to suffer irreparable damage through no fault of its own.

Of what value is medical and dental service unless the child is properly fed? Many mothers in the poorer districts, either through indolence or the necessity to engage in work outside the home, fail to supply proper meals for their children. Children are given a few pennies to buy buns, which (bad enough in itself) are spent upon confections. To meet this situation in the poor districts of many cities, lunches are supplied pupils at cost by the school authorities. By this means children are given a wholesome, nutritious, properly balanced lunch for five cents or less, including soup, bread, fruit and other prepared dishes.

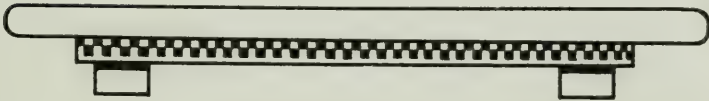
The dentist is interested in the school lunch. The lunch must not only contain the right elements, but be so prepared as to give the teeth proper exercise. The lunch table also should be properly supervised if children are to be taught "how to eat." The writer recently visited a school at lunch hour where every one of a hundred children deliberately soaked their bread in the soup. What neglect of a great opportunity to teach those children a much needed lesson in mastication!

The school lunch is an essential part of the plan to give every boy and girl, no matter what the home condition, a fair chance in life and a half decent opportunity to succeed.

Dedicated

The Committee of the Virginia State Dental Association, dedicated the recent State Convention in the following words :

“Every Art has its secrets of experience and skill, and master depends upon the patience and industry with which man seeks to command his own resources. From the time that man first dipped his fingers in the saliva of the human mouth, and tried to fashion a fitting decoration to the human face, from that time man has ever had before him a day, a perfect day, when he himself could direct and control the environment of teeth. To the man or men who give to us immunity from decay of teeth, we respectfully dedicate this convention.”





The Late W. T. Stuart, M.D.
Professor of Anatomy and Chemistry
Royal College of Dental Surgeons of Ontario

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 5

TORONTO, DECEMBER, 1915

No. 12

Centralized Dental Clinics for Children.

BY HAROLD DEW. CROSS, D.M.D.,
(Director, The Forsyth Dental Infirmary, Boston.)

WHEN the Forsyth Dental Infirmary for Children was founded, the first question discussed by its "Board of Trustees" was: "What ought to be the purpose and scope of this new foundation?" This question was exhaustively debated and it finally became the unanimous opinion of the Board that the simple treating of children's teeth and the extracting of hopelessly defective ones could only be regarded as a palliative measure. That, while it would *improve* existing conditions, it would not *eradicate* them. That its activities would be directed toward remedying the conditions in succeeding groups of children without any effective endeavor having been made to remove the underlying causes of the present widespread prevalence of dental caries among children of the present generation.

It was accordingly decided that for the foundation to produce the greatest results its efforts must be two-fold: first, the prevention of the existing prevalence of oral disease, and second, the treatment of conditions as they at present occur. It was easily recognized that the prevention of disease was the most important function.

(a) To prevent the wholesale prevalence of dental caries, it was evident that attempts ought to be made not

only to disseminate existing knowledge, but also to increase and extend the knowledge. To this end a campaign of education must be carried on; education of parents, teachers and children upon the importance of sound teeth and healthy mouths; education as to the best means of promoting oral hygiene; education of dentists upon the importance of oral prophylaxis and the necessity of asepsis in technique; that the spreading from mouth to mouth of other diseases than dental caries should be avoided. It was further evident that investigations of the causes of the existing prevalence of dental caries should be made, and that researches aimed at the prevention of these causes should be attempted.

To accomplish these purposes, it would be necessary that there should be lecture rooms, and appliances for teaching, and that a research laboratory should be provided and equipped. It seemed also desirable that the children, parents and nurses should congregate in considerable numbers in a single central place, not only that the reduplication of teachers should be avoided, but also that a larger selection of material for statistics and for research might be obtained. This central congregation of children is also valuable for its psychological effect on the child mind. Seeing other children attending a clinic is a great stimulant to others to do the same; seeing it largely attended makes it seem desirable and less to be dreaded and an emulation is excited to excel in the practice of oral hygiene.

(b) The treatment of conditions as they at present exist involves the establishment of the dental clinic. This clinic, in the opinion of the Trustees, should not be a makeshift where an hasty attempt to patch or to extract the greatest number of carious teeth in the greatest number of children's mouths in the shortest possible time should be its ideal. On the contrary, it was their belief that it should afford the very best in equipment and in practice. That, like a hospital, it should provide the newest and most advanced appliances, and that its practice should be conducted upon the highest and best approved plan. It would thus become the chief educative factor in dental practice as the hospitals have become the chief educative factor in medical and surgical practice. It would set a standard which would lead to the education and advancement of the dental profession and of the public as no other single factor could possibly do.

Such a dental clinic, it was felt, should have the most hygiene quarters embodying the most advanced improvements in hospital construction, should pay particular atten-

tion to the prevention and dissemination of the contagious diseases of children from its waiting room and checking room.

The latest improvements in chairs, cuspidors, electric engines, compressed air and water supply should be installed; the instruments should be of the newest and best design and of the highest quality, and sterilizers for the scientific disinfection of instruments and furniture of the newest and best pattern, should be supplied. The various methods of anaesthesia should be provided and recovery rooms for patients after certain forms of anaesthesia were thought to be essential and the provision of a few beds was thought to be highly desirable.

The correction of deformities of the teeth and jaws involve the newest methods of orthodontic practice which a dental clinic should provide. The removal of adenoids and tonsils, the chief underlying cause of these deformities, can of course be practiced in another institution, but it is essential that a Nose and Throat Department be connected with the clinic, the more intimate the connection the better. In our own institution such a department is included. The correction of deformities arising from these conditions calls for the highest development of orthodontia and an orthodontia laboratory and x-ray equipment are necessary for the best results.

Such, in brief, seems to be the ideal for the dental clinic, and if this ideal is not exaggerated, it seems to the Trustees that it conveys the answer to the question you have asked as to the advantages of a central clinic, as it is obvious that the lecture rooms, teachers, research and orthodontic laboratories, appliances for anaesthesia, etc., could not be duplicated in separate establishments except at an increased expense in proportion to the number of reduplications.

The Forsyth Infirmary was built and equipped upon the plan outlined above. So far the management has met with no drawbacks and has no reason to regret its plan of operation.

The question of the transportation of patients to and from a central clinic has never been an important one in Boston. The Elevated Railway Company by a system of transfers carries a passenger from any part of the city or its suburbs to a given destination for five cents. Nurses provided by the school authorities supervise the safe conduct to and from the Infirmary of the smaller children, bringing them in groups. Other children are brought by

their parents or by older brothers or sisters. The Forsyth extends its benefits to all children of Boston and its suburbs under sixteen years of age whose pecuniary circumstances preclude their securing the services of a private dentist. At the present time this pecuniary eligibility is based upon maximum of \$4.00 per week per person in the family. That is, if the family income is \$20.00 for a family of five, the children of the family become eligible. The number of children at present cared for is between four and five hundred per day. This number will be gradually increased. A charge is made of five cents for each visit.

In conclusion, we would say that the question of localized clinics was very carefully considered by the Trustees before the plan of a central clinic was finally adopted. Members of our Trustees had had experience in such local clinics and were opposed to them not only for the reasons given above, which, of course, made them prohibited, but also because in their experiences they had found them exceedingly unsatisfactory in practice. They were unsatisfactory because (a) It was exceedingly difficult to control the attendance of the operator. They were liable to come late, to leave early, and possibly not to come at all. Very strict supervision was found necessary to improve punctual and full attendance. (b) It was almost impossible to exact an equal standard of work done in the different clinics. This difference of standard quickly became known and clinics were patronized or neglected according to the standard of work and equipment supplied. (c) A suitable equipment meant an expensive reduplication of plant. This necessarily occurred no matter how inadequate the equipment of a given plant might be. It further meant an idle equipment in many instances for certain hours of the day. (d) It was found that the trained dental practitioner was obliged to waste a greater or less part of his time in clerical or nursing work and by attending to other duties than his strictly professional services. (e) It was found to be exceedingly difficult to regulate the purchase and cost of supplies and to check their application. (f) And lastly, it was found that the providing of hygienic and septic quarters was almost impossible.

Localized Dental Clinics for Children.

BY WALLACE SECCOMBE, D.D.S.

(Chief Dental Officer, Board of Education, Toronto.)

INVESTIGATION has shown, again and again, that there are so many children of the poor who cannot pay for private dental treatment, that unless clinical provision be made for them, they will receive no attention whatever. Of the pressing need for free dental clinics there is no doubt. Opinions differ, however, when we come to consider methods of organization and control.

The magnificent Forsyth Dental Infirmary for children has been established in the city of Boston through the benevolence of members of the Forsyth family. Announcement is now made that Mr. George Eastman of Rochester, generous and worthy citizen that he is, has made possible a very similar Infirmary in the city of Rochester. Without detracting in the least from the excellent and valuable service such institutions may render, the question may quite properly be asked,—Is such a plan the best upon which to proceed in the establishment of dental clinics for children? Viewing the matter broadly from the national standpoint, should we, as a profession, encourage the establishment of Dental Infirmaries here and there, as distinct and separate organizations, depending more or less upon private benefaction? Having regard to our experiences in Toronto, covering a period of five years, it is the judgment of the writer that both of these questions should be answered in the negative.

It is not my intention to trace the development of the work in Toronto, other than to pay sincere tribute to the memory of the late William H. Doherty, who was the first Chief Dental Officer of the Toronto Board of Education, and to whom credit is due for the splendid organization which obtains in our school clinics to-day. Dr. Doherty left many monuments to his memory, but none are more appreciatively remembered than his self-sacrificing endeavors on behalf of the school children of Toronto.

The organization of Dental Clinics for the adult poor has been accomplished by Dr. J. A. Bothwell, working under the general supervision of the Medical Officer of Health for the City of Toronto. These two systems of clinics, the one designed for children and the other for adults, have been operating in the greatest harmony, and nothing but com-

mendation is due Dr. Bothwell for the excellent service the Municipal Dental Clinics are rendering.

The complete organization of the Medical Inspection Department of the Board of Education, Toronto, is as follows: One Chief Medical Officer (Head of the Department), one Chief Dental Officer, one Superintendent of Nurses with three Field Nurses. In addition, there are: one Medical Officer doing special tubercular work, nineteen regular Medical Inspectors, fourteen dental officers and thirty-four nurses. The entire staff, comprising fifteen dentists, twenty-one physicians, and thirty-eight nurses, co-operates in the most active and helpful way.

In so far as the dental work is concerned, the city is divided into fifteen districts with an average of six schools in each. A dental clinic is established in one of the school buildings in each district, and in no case is a school more distant from a dental clinic than may be comfortably walked by the child. The dental clinics are in operation from nine to twelve each school morning and the salaries of the operators \$800, with an annual increase of \$100 to a maximum of \$1,200.

Dental service is provided only for those who are unable to pay regular dental fees. The school nurse investigates home conditions and cases are accepted only on the nurses' recommendation and after the parent or guardian has given signed consent that the work should proceed. This latter is a most important consideration. Without the parents' consent, the operator and authorities place themselves in a very awkward position should the parent wish to cause trouble.

At the very outset we must bear in mind that the problem has two distinct phases; namely, prevention and treatment. The one is the complement of the other, and to undertake either alone is to invite failure. In the case of children, preventive measures are doubly important. The child is passing through the period of marked development, the period of greatest susceptibility to dental disease, and the best period for the acquirement of good dental habits.

The preventive work assumes a position of great importance. The maintenance of the child's mouth in a hygienic condition is fundamentally an educational problem. Through neglect or ignorance, the problem may unfortunately become a health problem, but fundamentally it is a matter of education. The word education is used in no narrow sense. Education has come to mean something more than mere learn-

ing. It is learning how to live and act, and thus the activities of modern school life have become as varied as human experience and endeavor.

The modern school is becoming more and more a social centre for the community. This is particularly true of the poorer districts, where afternoon meetings for mothers and evening lectures for parents are frequently held. These facts combine to increase the importance of school organization as a factor in preventive treatment.

Preventive measures include questions of diet, mastication and oral cleanliness. These are matters requiring systematic control of the child and it would seem the natural thing to take advantage of school organization and discipline to put into effect all of those procedures that might be classified under the general heading of oral hygiene. The daily hygienic care of the oral cavity is best secured by enlisting the sympathetic help of the teacher, who is able to take advantage of school discipline and daily contact with the child.

For the purpose of magnifying the importance of oral hygiene and of securing the co-operation of the members of the teaching staff, a system of grading each child has been adopted. This is known as the Oral Hygiene Grade, and is represented by the figures 1, 2, 3 or 4, with the following significance:—

Grade No. 1—Mouth conditions *excellent*.

Grade No. 2—Mouth conditions *good*.

Grade No. 3—Mouth conditions *fair*.

Grade No. 4—Mouth conditions *poor*.

A suitable blank form is provided upon which the nurse enters the name of each child. The examination is made and the figure entered representing the oral hygiene grade. These figures are added and the total divided by the number of scholars in the class, thus arriving at the average oral hygiene grade for the class. Another blank form is provided upon which the nurse enters the average grade of each class in the school, by which means the oral hygiene grade of the school is determined.

Without going too much into detail, the following tabulation indicates the results of the oral hygiene grading of the public school children of Toronto:

6 schools graded excellent.

54 schools graded good.

24 schools graded fair.

Not a single school was graded poor.

These figures bear wonderful tribute to the good results of dental work in Toronto schools, and yet it is the hope that at our next grading the results will be even more gratifying.

The scholars will be graded again next Easter, when it will be a simple matter to compare the oral hygiene progress of any school, class, or individual scholar.

It is hoped that by the publication from time to time of these grades, a greater interest in mouth cleanliness will be awakened in the individual scholar and a certain element of competition engendered among the teachers, that their class make a favorable showing in this regard.

A large central Dental Infirmary is practically a hospital with its work confined to the out-patient department. Experience has taught that the out-patient department of a hospital is the most unsatisfactory of any. Physicians have not sufficient control to either properly direct home treatment or secure regularity of attendance. In many cases the difficulty becomes so acute the patient is transferred to the in-patient department, that the physician may have better control of the case. Similar difficulties arise in the conduct of a dental college infirmary, and it would seem but natural that in dealing with children these difficulties would multiply in conducting a central clinic.

In a very large percentage of cases the children have to be accompanied by a nurse or other adult. This is inconvenient and expensive. In the case of older pupils, car fare each way would prove a hardship to those too poor to pay for ordinary dental service.

Dr. Bion R. East, Chief Officer of the Dental Department of the Detroit Board of Health, has said: "We believe in more clinics in school buildings where we can reach the children more easily. The greatest objection teachers and principals express to the Detroit system is that children are required to be absent from their classes too great a period when attending a dental clinic which may be several blocks or even miles from the school buildings."

"When the clinic is located in the school itself, students are never away from classes more than one half hour, and this can be so arranged that it occurs during a period when the student will lose the least amount of time from his or her studies."

Dental disease is a matter of public concern and we do well to link this work up to official public channels and thus secure official recognition and, what is equally important, public funds to guarantee permanency of upkeep. In considering a standardization of plans for the organization of

dental clinics for poor children, we must consider the smaller places and rural districts as well as the larger cities. The plan of utilizing the school building is as applicable to the rural as it is to the urban district. A great saving in capital expenditure is affected and hundred of dollars are also saved in annual charges for heat, maintenance, janitor service and sundry charges. The greatest saving is, of course, in expenditure for buildings and building maintenance. Dental equipment, dental supplies and salaries account are practically the same for a given number of operators, whether the plan be one central clinic or a number of clinics distributed throughout the district.

The location of a dental clinic in the school building has an added advantage in allaying the fears of the child. A visit to the dental clinic becomes a matter of school routine and is not objected to. The dentist is a co-worker with the teacher and has the confidence of the pupil to a remarkable degree. The operator is able to requisition the co-operation of his young patient and follow up those cases where neglect of oral cleanliness is apparent.

The report of a special committee of The Bureau of Welfare of School Children of New York City in discussing the utilization of school plants in locating clinics for the treatment of dental defects, points out that the use of school buildings makes for considerable economy in eliminating certain fixed charges as rent, light, fuel, etc. In addition, it removes the objection so frequently raised, that clinics are at too great a distance from a great many schools, and cause loss of time to pupils, nurses and mothers in going to the clinic, and also in a great many cases (only poor children receive such treatment), they find the expenditure of car fare a serious burden, if it does not actually prevent their attending. At a conference held under the auspices of the Bureau of Welfare of School Children and a special committee of the First District Dental Society of the City of New York, it was recommended among other things, that Dental Clinics be established in school buildings.

For purpose of X-Ray and other special work, one of the clinics could be set aside and would, of course, become a central clinic for these special cases.

The interest of Boards of Education in the establishment of School Dental Clinics is promptly awakened by a presentation of the question from the economic standpoint. Children with physical defects are greatly retarded in their work. The New York Bureau of Welfare of School Children reports that the children themselves are not only the victim

of this condition, but also hold back other members of the school who are physically fit to go ahead, but cannot do so without leaving the retarded ones behind. In other words, the pace is set not by the brightest but by the poorest pupils. Since tuition and books are furnished free, the facilities whereby the pupils may avail themselves of these benefits to the utmost, should also be provided. It is undoubtedly less expensive to supply eye glasses, for instance, for children who cannot see well, than to have them repeat their grades time and time again. Non-promotion is frequently caused by loss of instruction due to absence from school through illness, and the definite relationship between oral sepsis and general disease has been clearly proven.

The advantages of Dental Clinics established in the school buildings may be summarized as follows:

1. The plan is less costly.
2. School discipline gives control of child for treatment as well as follow-up service.
3. Through the assistance of the school teacher, the daily cleansing of the mouth by the child may be checked up.
4. In the acquiring of good dental habits of mastication and oral cleanliness, the child is usually influenced more by the teacher than by the parent.
5. Complete dental statistics regarding oral conditions are only to be obtained through the systematic dental examination of children in the school building.
6. Schools are becoming more and more educating centres for the community in which they are situated.
7. Dental operators are under same regulations regarding hours and discipline as are members of the teaching staff.

Disadvantages of a central clinic as they appear to the writer are:

1. The necessity of children travelling long distances with the consequent expense of transportation. Ten cents for car fares each visit is a hardship to those who are too poor to pay for regular dental service.
2. In cases of younger children, the inconvenience and expense of an older person accompanying the child each sitting.
3. Lack of control of the child regarding subsequent sittings and the impossibility of the daily follow-up.
4. Lack of co-operation between school, home and dental clinic.

In presenting these facts for your consideration, the writer has no thought of minimizing the possible advantages of a central clinic plan, but would urge, in view of our experience in Toronto, the many advantages of following the school system which has already been thoroughly tried across the water and found most practical and efficient.

Color of the Teeth.

BY DR. F. H. ORTON, PROFESSOR OF CROWN AND BRIDGE WORK,
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ALTHOUGH the mechanical part of crown and bridge work has been justly commended, yet it cannot be denied that something more than excellence of craftsmanship is implied in the many hyperbolical descriptions extolling the fineness of the work and its truth to nature. What is really implied in these descriptions is this: That crown and bridge work has passed beyond mere science; in fact, that it is an art. Do not let it be inferred that I intend to belittle in the slightest degree the mechanical ingenuity which has found expression in the evolution of the artificial crown; what I have to say has been suggested by the claims of dentists themselves.

If crown and bridge work already has a place among the arts, it is altogether fair to ask, what is its technique? What are its standards? I have only to phrase these questions, and they answer themselves immediately. I do not mean to suggest here that there are not favored individuals in the profession who are endowed with some special love for art and a perception of its more palpable beauties, who pick up in the course of time a great deal of empirical knowledge, working their way back to first principles through studies and reflections that should have been offered as a preparatory course for their work. My point is this: Whereas there is a technique, a code of procedure for the mechanical part of the work, which serves as a guide to the student of dentistry, there is no such guide for the higher aspect of the work—that aspect which gives us the right to consider the replacing of the natural crown by the artificial one as among the fine arts; all this is left entirely to the individual. It would be idle to deny that individuals have accomplished nothing; often, indeed, they have accomplished a great deal, but only as *individuals*. Each one who

obtains any results in this field laboriously works out for himself his own theory and practice; and when he passes away, his art perishes with him. I need not insist on the loss of effort caused by this method of working, nor upon what the profession as a whole loses by one person not being able to begin where another leaves off. It is as if all the knowledge that the first generation of men acquired should disappear with them, as if the new generation must begin again at the bottom. World-progress under such conditions would have been impossible. The word *civilization* would never have been born. Progress on the artistic side of dentistry is likewise impossible without formulating and codifying the experience of individual dentists. A manual of principles and rules of guidance must be drawn up. Future students ought to have it made possible for them to profit by the knowledge and discoveries of dentists who precede them.

Although I thus analyze the existing situation with respect to dentistry as a fine art, yet I do not assume to possess a knowledge of such compass as would enable me to formulate a course of study, even of the most elementary character, in this particular branch. Nevertheless, my years of endeavor in comparison with their puny results, and my discouragements as an instructor have made the formulation of some definite principles of art technique appear to be a permanent necessity. The thought has been many times driven home to my mind that under proper guidance, using the discoveries of those who have preceded me, or, of my contemporaries, it would have been very easy for me to have acquired long ago even more than that which I have painfully and imperfectly learned by experience alone. This paper is, therefore, not intended to be a treatise on technique; it merely expresses my individual theories, knowledge and convictions on one particular point.

It is agreed, I am sure, that crown and bridge work ought really to be an art. It is then proper and necessary to ask which one of the many definitions of art would best apply to it. Upon careful consideration I have found the answer most appropriately given in the trite but revealing epigram: "True art is to conceal art." In this epigram we also find described our difficulties and limitations. For we must reproduce nature exactly as we find her. Even her variations and imperfections must be copied. And right here our restrictions begin to make themselves felt. The artist in oil or marble has more latitude than we have. It

is always within his power to flatter a little. In more dignified phraseology, he idealizes nature. He finds her unfinished and imperfect. She has good intentions, of course, but as Aristotle said, she cannot always carry them out. We dentists, however, cannot take liberties with our art. If we adopt as our ideal motto: "True art is to conceal art," we must mean,—as we ought to mean,—that we are going to try to make a real imitation of nature, an imitation so perfect that nature herself would be deceived. In a word, we must compete with nature. Only when the observer cannot tell which is art and which is nature, can our work be considered wholly successful and artistic.

Such perfection of imitation inevitably implies an intimate study of nature. And indeed, the best artists of every period and of every department of art have developed upon this foundation. We, in our field, claim to be artists, but do we begin where we ought? Do we, in any complete sense, go to nature? Permit me to answer this question by asking another more concrete: If we studied nature carefully, instead of copying from each other, would we be satisfied to work with the conventionalized teeth which are furnished us by the manufacturer? We know that the bit of porcelain with which we make our crown is, as to characteristics, shape, and color, utterly unlike the human teeth. Rarely, indeed, can a porcelain be found which exactly fits, in all particulars, the case in hand.

It may be asked at this point: Why does not the manufacturer give us better teeth with which to operate? The answer is obvious: Because we do not require him to do so. He furnishes the profession with what is demanded, just as does any manufacturer. He is influenced in the production of artificial teeth by those shapes and colors which had the best sale the preceding year. And it is certainly not to be expected, in this unaltruistic age, that he will concern himself with a careful imitation of nature when dentists will unthinkingly take what is offered them. The product of the manufacturer is determined to a great extent by the large orders which are sent to him by the big advertising dental shops and laboratories. These shops order perhaps a hundred sets of teeth at a time. The point for us to note is that these teeth are all of one shape and color. In a recent conversation with one of the heads of a large dental manufacturing company, I asked whether the company would be willing to furnish a new set of models. He answered immediately: "When the dental profession knows

what it wants, we will supply the demand; we cannot do business on any other basis." Certainly, manufacturers cannot be blamed for not undertaking to educate us as to what we ought to demand in order to do really artistic work. The fault, obviously, lies not with them, but with dentists themselves.

Perhaps it would be well at this point to look for a moment at the porcelain facings furnished us by the dealer. I might discourse at length on their unnatural shape, but I shall pause only long enough to say that the authoritative treatise on the anatomy of the teeth by Dr. Black and Dr. Brownell leaves no excuse on the part of manufacturers for furnishing us with such sorry imitations of the natural crown as we are obliged to use. I might also dwell on the fact that by far the largest percentage of indications for Richmond crowns are in the mouths of patients past middle life; and yet the facings furnished have the appearance of the teeth of youth. They show no signs of age, no marks of wear. I know well, however, that abrasion, erosion, and even atrophied enamel formations may be imitated by grinding and by the use of high fusing colors. I believe that we have a right to demand that the manufacturer furnish us with teeth which show all of the peculiarities of age. But it is not these things which I wish to emphasize in this paper; I wish to discuss the color of the teeth.

In the American-made teeth furnished us, the pigment, in a large proportion of the facings, is not properly distributed; it is put on the lingual side of the facing, and extends only over the gingival third. It follows that should we succeed in getting a facing somewhere near the size and color desired, the grinding of the gingival bevel which would be necessary in order to have the facing approximate the labial bevel of the band, would mean the loss of color. Even if this were not the case, the color would still be defective in extent, since the color in the natural tooth, while gradually decreasing in saturation, extends in most cases to the incisal third. This is especially true of cuspids. Furthermore, while the natural teeth in the same mouth will be of the same hue, there will usually be found a marked variation in tint, shade, or saturation. The cuspids have the greatest saturation and the laterals the least. These facts must be familiar to every dentist who has the least clinical experience; yet the manufacturer seems to have overlooked them entirely.

In order to get at the problem before us it is necessary to inquire first of all into the probable source of the color in the teeth. It is my belief that the tooth-crown receives its color mainly from the dentin, although the pulp may be a contributing factor. About 25 per cent. of the dentin is made up of organic matter. After the death of the pulp the organic portion of the dentin disintegrates, causing the tooth to become darker, and in some cases, radically changing the hue. In old age, when the pulp recedes, the hue appears to become more saturated, resulting, in some cases, in a decided orange. Since, in my opinion, it is the organic matter of the dentin which is mainly responsible for the color of the teeth, owing to the small amount of organic matter contained in the enamel, the color contributed by the enamel is probably negligible. Indeed, American histologists are practically unanimous in agreeing on the absence of organic matter in the enamel. European distologists believe, however, that the enamel contains a slight amount of organic matter; but even they do not claim over 5 per cent. The amount of pigment contained in so small a percentage of organic matter would be hardly appreciable. Normal enamel, then, can be expected to contribute only white or brightness value to the color of the teeth. Very frequently, however, where the labial and lingual plates of enamel come together for a short distance on the incisal (most frequently seen in the lateral), the dark oval cavity is reflected through, and gives a grayish, and in some cases what appears to be a bluish, hue to the incisal. We have all experienced disappointment, I think, in trying to match this so-called blue tint in the incisal region. It is possible to obtain facings with a very washed-out blue tint at the incisal edge but they do not look natural when placed in the mouth.

Suppose, now, that we consider the enamel by itself. What is its color? We all have a more or less hazy notion, I think, but no exact symbol or symbols by means of which to express it. We usually call it gray. Do you mean by that what psychologists mean, namely, a mixture of black and white? The inexactness of our symbols of expression will be realized when I recall to your minds that although we are able to distinguish some 700 different brightness qualities between the deepest black and the most brilliant white, we have only about four symbols in common use by means of which to express them all: black, white, light gray, and dark gray. I have come to the conclusion, through my

own experience and by questioning a number of my fellow-practitioners, that the enamel of the teeth may well be compared to a white pearl. This comparison may be best appreciated by examining the rounded cusps of a freshly extracted bicuspid or molar. And indeed, to refer to the youthful denture as a row of pearls is not inappropriate. The teeth of people of mature years, however, never receive such poetic comparison, for the enamel becomes stained with age. In this sense alone can the enamel be said to contribute to the color of the teeth.

If we make a casual examination of the stock of teeth at the dental depot, we would be inclined to say that the hues, tints, and shades of the solar spectrum were fairly well represented. Yet to the initiated the imperfection of the display is altogether too evident. And who of us has not repeatedly been disappointed in trying to match the human teeth? We are all more or less convinced, I am sure, of a serious defect somewhere. When we stop to think, however, our sense of justice, as I have said before, tells us that the blame does not rest alone on the dental manufacturers, for we ourselves do not, in most cases, know what we are really looking for. Even those favored persons who can carry the hue in their memories, or in their eyes, as we commonly say, rarely have any symbol which will exactly express its position in the solar series. Our terminology is lamentably deficient. Perhaps we call the illusive hue yellow. It is then fair to ask whether a color as pure yellow is to be found in the teeth of the Caucasians? It is generally true that the color of the teeth of the type called brunette will be found to be more saturated than in a blonde, and the pigment will be found to vary in proportion. For nature, here as elsewhere, tends to maintain an equilibrium, or harmony, in the body pigments. In the eyes, hair, skin and teeth there is usually a harmony of color. For example, if we should analyze the feelings we experience on first seeing a woman with her hair dyed red, the word *discord* would best express them, for the skin and hair would not be in harmony; and therefore the effect is quite the opposite from the one intended. A want of harmony between the hue, tint and shade of the teeth and skin is equally unpleasant, and yet I think it is an uncommon experience to see a porcelain crown that we cannot instantly detect, and which, if we were to pass judgment, we would pronounce off-color. In other words, we are conscious of the discord. My conclusion at this point is, therefore, that

the first prerequisite for understanding the color of the teeth is to classify the types of human beings accurately, and name the color of teeth each type possesses.

If we had only distinct types to deal with, however, such as blondes and brunettes, the task of standardizing the color of the teeth might be comparatively easy. But by far the largest percentage of human beings are of that indefinite type which we class as brown-haired. Members of this class may have either blue or brown eyes, either light-brown hair or dark chestnut. Now, brown is a mixture of yellow and black; therefore it would not be accurate to symbolize this large group, the individuals of which are neither blonde or brunette, as *brown*. Here we have another problem in terminology.

Enough has been said to show that we cannot get very far without accurate classification and symbols. We need the symbols to express our thoughts. Such a classification would not only result in more artistic production by the profession, and thus be a source of increased pleasure and pride in our chosen calling, and a great economy of time, but it would enable us to speak with authority; to agree on what we want. And the manufacturer could not lag far behind us.

It is not enough, however, to have the types of human beings accurately classified with a symbol designating the color of each; a knowledge of the fundamental laws which govern the phenomenon of color is a prerequisite to such as investigation. This appears on the face of it to be a formidable matter. A brief sketch, in which I hope to show their practical application to the subject under discussion, will convince you, however, that the difficulties in the way of the standardization of the color of the human teeth are more apparent than real. First: Let me repeat that the hues to be found in the different types before mentioned, need to be standardized. I have come to the conclusion that the hues to be found in the Caucasian race lie somewhere between orange and red, and orange and yellow, in the spectral series, with the addition of white and black values; and that all the other colors are due to the effect of what are known as the phenomena of simultaneous contrast, successive contrast and negative after images. Second, we must adopt symbols or words which will express exactly the hue, tint, or shade indicated, and the degree of saturation; for pure tones are never to be seen in the teeth. In other words, we must have a systematized nomenclature of all the colors to be found in the human teeth.

The reason why we have no terminology for the colors to be found in the teeth, as well as in many other things, is due to deficient sensitivity and education. Yet natural history abounds in proofs that color discrimination is innate not only in man, but even in animals. Darwin devotes several chapters to color discrimination among animals, and shows color to have a definite purpose and to be useful either as a means of protection or concealment from enemies, or as a means of recognition by their own kind. Colored fruits form by choice a considerable part of the food of monkeys in the tropical regions of the earth.

If monkeys can distinguish colors, then surely it may be inferred that so could the most primitive men. Tests on primitive people for the purpose of determining the sense-acuteness, have brought out the fact that their power of discriminating color was about equal to that of children in the first grade or in the kindergarten. In addition, the color vocabularies collected from different regions showed instances in which a single word was made to do duty for two or more color-sensations; that is, black and blue, for blue and green. All peoples, however, have a definite symbol for red. Such confused nomenclature naturally implies corresponding limitations in the degrees of sensory color-discrimination. And there are unquestionably other factors at work in determining the differentiation of the names for sensations. In the first place, it is quite conceivable that a sensation may not be of sufficient value or interest to receive a special name, although it is capable of being fully experienced and discriminated. Were we, for example, to ask of a civilized community what object they would describe by the word *gray*, surprising, indeed, would be the variety and incongruousness of their replies. Yet such confusion would not be inevitably the expression of deficient sensitivity. People could easily learn, under stimulus, the exact difference in meaning between *gray* and *buff*. The conclusion is that certain instances of confused terminology may be due simply to insufficient pains having been taken to analyze sensory experiences.

This conclusion is further borne out by a color test given at my request in the Irving Kindergarten School of St. Paul. The test was with Holmgren's wools. It was found that those children who had learned the names of the different colors could sort them, but those who did not know the names confused red with pink, and blue with violet. Faintly colored wools tended generally to be confused with one another.

From all this, I think we may safely and reasonably conclude that color-discrimination is innate; and second, that the power of discrimination among the finer shades and tints is only a matter of education. This second point has an important bearing, as you can readily see, on crown and bridge work considered from the viewpoint of an art.

But already in discussing a few of the factors that in my opinion, should be included in a treatise, even of the most elementary kind, dealing with the artistic side of the matter under discussion, I have used what might be called technical terms of a nature, which some will protest, no dentist can be expected to know or understand. Such a protest, of course, is a naive confession of ignorance, because a knowledge of the vocabulary of color is a prerequisite to even an elementary study of nature. It points further to a serious lack in our educational curriculum. A scientist should certainly know the terminology of his science and related sciences. For the replacing of natural teeth with artificial substitutes is the one science and art which we cannot help practising; and if we cannot practise it well, we must continue to practise it poorly. In order, therefore, to make my points more intelligible, perhaps, I shall include at this point what must necessarily be a very sketchy and superficial review of the science of chromatics, and this merely for the purpose of making my nomenclature clearer.

Light—I refer to solar light—is the physical cause of our sensation of light. Webster defines light thus: “Light is that agent, force, or action in nature by the operation of which upon the organs of sight, objects are rendered visible, or luminous.” Without going into the various theories of light, let it suffice to say that it is composed of an indeterminate number of variously-colored rays. The sensation of color depends upon a peculiar function of the retina, or optic nerve, in consequence of which rays of light produce different effects according to the length of their waves or undulations, waves of a certain length producing the sensation of red, shorter ones green, and those still shorter blue, and so on. The color of objects depends upon their power to absorb or reflect a greater or less proportion of the rays which fall upon them. In other words, the natural color of objects results from the fact that one portion of the colored rays contained in white light is absorbed at the surface of the body, while the other portion is thrown back. It is the ray which is thrown back that gives the color to the object. For example, if the light which falls on an object is com-

pletely absorbed by that object, so that it disappears from sight as if falling into a perfectly dark cavity, the object appears to us black. On the other hand, if all the light is reflected from the surface, the object appears white. The rays may also be modified by the character of the surface.

You can readily see how this affects our science. If the object is polished, as are the surfaces of the artificial teeth furnished us by the manufacturers, the rays are pressed together, as it were. They are then thrown back as a solid beam. If, however, the surface of the object is irregular, as is, for example, the enamelled surface of the natural teeth (I refer to the imbrication lines of Pickerell), the rays are dispersed in every direction. While the unabsorbed rays may be the same as those thrown from a polished surface, yet we are immediately conscious of a difference in color. This has an important bearing on the color of the teeth. It is at once apparent that to obtain a perfect match in artificial teeth, we must have not only the same color, but also the same kind of surface. I have no doubt, however, that since both Pickerell and Williams have called attention to this subject in their exhaustive monographs published recently, the tooth manufacturers will soon accept the suggestion.

Another matter that must be taken into consideration is the checks and cracks to be found in the enamel of the teeth as people grow older, especially in those of people past middle life. In the same way that the grooved surfaces of the enamel affect the hue of the teeth, so these checks and cracks must be counted as a modifying factor when matching artificial and natural teeth.

Since the color of the teeth is affected by so many factors, it will perhaps be wise to go more deeply into the definition of color. The psychologist recognizes three aspects of color: hue, degree of saturation, or purity; and illumination, or brightness. When a ray of sunlight is admitted through a small aperture in the window-shutter of a dark chamber, what is seen is a round and colorless image. If, however, a glass prism is interposed in its path, the beam on emerging from the prism becomes refracted towards its base, producing on a distant screen a vertical, rounded band no longer white, but showing all of the hues of the rainbow. This is called the solar spectrum. What has happened is this: the white ray has been broken up into its elemental hues—red, orange, yellow, green, blue, violet. It is interesting to note at this point that here is the only place in nature where we

get pure hues. The hues of the landscape, for example, are always modified by a mixture of white or gray light.

But to return to the matter in hand. Now if we should discover that the hues in the human teeth could be placed in the orange part of the spectrum, we would have an important starting-point. In order, however, to match the exact tint or shade of orange, it would be necessary to determine not only the hue, but the degree of saturation or purity. This can be best illustrated by charts, the first one showing the highest degree of saturation possible to obtain. The next chart is slightly less saturated, and so on through fifty charts. The last chart shows only a faint tract of the orange hue. The point to be noticed here is that the hue is the same. No other hue has been added because of the lower degree of saturation, for white is not properly a hue. It is not correct, however, to call the diluted orange tint, yellow. Yet this is the mistake made by the average person. A course in color-discrimination would not come amiss in order to avoid such common errors. The mistake of calling orange yellow has been made, I believe, by Dr. Clapp; for the charts attributed to him and published in J. Leon Williams' book on *A New Classification of Tooth Forms* shows the gingival third of the tooth as orange, in which there is a slight overlapping of yellow; the middle third is called yellow; and the incisal third, gray. While I believe that Dr. Clapp has distributed the hue about as it is found in nature, yet the pigment in the dentin will be represented, it must be emphasized, by *one* hue with a more or less degree of saturation.

Another interesting element enters into the situation. Those of us who have offices which admit the direct sunlight during certain hours of the day will appreciate the effect of illumination or brightness in changing the hue of the teeth. The red end of the spectrum when highly illuminated gradually changes to orange. If the brightness is increased, it appears yellow; and if still further increased, it looks white. The blue end of the spectrum, on the other hand, becomes gray under increased illumination. Conversely, if the spectrum is darkened, the red end looks brown or black, and the blue end looks black. This can be readily tested by walking at twilight in a garden filled with variously-colored flowers. As darkness gathers, the colors gradually disappear, even though the shapes of the flowers may be distinctly seen. The photograph illustrates the same thing. The hue here is left out, only degrees of

brightness being noted. In matching the teeth, therefore, the kind and amount of illumination under which they are seen has to be considered. Let me explain this matter more in detail. The natural teeth, because of their position in the mouth, surrounded as they are, by the shadow of the lips, and back of them the more or less dark, oral cavity, will be under a very different illumination from the artificial tooth held in the hand or tweezers, or in front of the patient. In order to be sure that the artificial tooth will match in color the natural teeth, it is best to defer the selection of the tooth until the tooth to be crowned is ground off sufficiently to allow the facing to be placed in the exact position it is to occupy permanently.

Now, we must take into account one other thing in order to match our teeth successfully. If we look for some time at a red, and then look at a colorless wall or a piece of paper, we find that a greenish tinge is given to the colorless wall or paper. Similarly, if we do the same thing with a greenish object, we find it to be followed by a reddish tinge. Again, if we look for a time upon a yellow object, and then focus on a colorless ground, the latter takes on a bluish tinge. Similarly, the blue is followed by a yellowish tinge. This is the phenomenon of *negative after-images*. Again, if I place a yellow and a blue alongside of each other, the yellow will appear "yellower," (i.e., more saturated) and the blue will appear "more" blue, at the line of junction. If I place a green alongside of a red, the green and red will each appear more saturated at the line of junction. This is called *simultaneous contrast*. Again, if I look from a yellow to a blue object, the latter will appear "more" blue, i.e., more highly saturated, than before. The same holds of the relationship of red and green. This is called *successive contrast*.

These things must be taken into account and guarded against if we would make successful matches of color. A bright object appears brighter when put alongside of a darker one, and vice versa. And just as the object that is placed alongside of the red takes on a greenish tinge, so the human teeth appear greenish when seen surrounded by the healthy red tissues of mouth and lips. Thus teeth that in themselves are of a decidedly orange hue, will often appear greenish yellow, as a result of their being surrounded by very red tissues. In short, the factor of negative after-images and simultaneous and successive contrast tend to

make the teeth appear of a different hue and a different brightness when inside and when outside the mouth.

As I stated at the beginning of my paper, it has not been my intention to formulate here a course of study which will give us the right to consider crown and bridge work among the fine arts. I have merely endeavored to indicate a few factors which enter into securing artificial teeth that shall be a real imitation of nature. The requisites of prime importance for the individual dentist are: to be fully informed on color; to train his powers of color-discrimination, and thoroughly to understand all of the elements which enter into a modification of the color of the teeth.

—*Journal Allied Dental Societies.*

Interproximal Space and Tooth Form.*

BY CHARLES E. WOODBURY, D.D.S., COUNCIL BLUFFS, IOWA.

GENTLEMEN of the St. Louis Dental Society: It is very interesting for us individually or as a society to explore new fields or to travel in those by-ways which are little used or over which we ourselves infrequently pass. The well beaten trail which we use every day to go from our homes to our offices has little to interest us. Frequent use has satiated our appetite for its beauties. Its grades have been made easy, its paths smooth and very little effort is required or novelty experienced in its passage, consequently we lose interest in its traverse. The same thing is apt to occur in the ordinary practice of the office. Those things which we have done daily for years, those conditions which present themselves to us hourly, are less apt to receive intelligent individual thought than is the occasional operation which has not become a matter of routine.

It is really more important, however, to perfect ourselves in the science and technique of the daily operation than to devote our best efforts to those operations which we only occasionally perform. We earn \$100.00 making amalgam fillings when we earn \$1.00 treating disease of the antrum. We benefit our patients far more making good crowns and bridges than we do when successfully extracting impacted third molars. If we can improve our technique in these daily tasks in one small particular, is it not

*Read before the St. Louis Dental Society, March 15, 1915.

more important both to our patients and to ourselves than any other means of devoting the greater part of our professional energy?

This, gentlemen, is my excuse for reading to you a paper on a subject with which you are all familiar. If I can bring to your attention one new idea, or if the discussion brings a new thought to any of us, or if we are spurred on to renew the use of some of those things which we know and have done, but have recently neglected, the time will be well spent.

In treating of the interproximal space it is also necessary to consider the proximal surfaces of the teeth and the tissues lying adjacent thereto. These might be classed in four areas, the septal area, the embrasures, the proximal surfaces and the contacts. The interproximal space varies much at the gingiva according to the shape of the teeth, the age of the patient, the health of the peridental membrane, the extent of the caries, the excellence of the dental operations and the amount and kind of use to which the teeth have been put.

The septal area should occupy the position of a pyramid with its base on the alveolar process, two of its sides on the proximal surfaces of the teeth, its apex at the contacts. The embrasures are to the buccal and lingual of the contacts and are the triangular spaces between the contacts and the axial angles of the teeth. The contacts are those portions of the proximal surfaces which actually come into contact with each other. The proximal surfaces are those surfaces which approximate each other. It would be difficult to say which of these areas is the most important, as the health of the teeth depends on all four and each of the four depends on the others. The keystone, however, is the contacts. If these contacts are insufficient, improperly formed or missing altogether, the soft tissues in the spaces become inflamed and absorb. If the teeth move together the embrasures become narrow and fail to be cleansed by the excursions of food. Plaques of bacteria lodge on the surfaces and caries results. If the contacts are rough or improperly formed decay of the approximating tooth will occur.

The width of the space at the gingiva should never be less than one and five-tenths mm. and is often as wide as three mm. Teeth of the thick-necked type have less space than the bell crowned ones. The age of the patient has much to do with this space. The teeth being set in an elastic socket, move considerably on one another during use, wearing the proximal surfaces, and it is a rare thing to find a person

of 35 or 40 years of age or over with normal contacts. The loss of mesio-distal diameter from third molar on one side to the third molar on the other side averages at that age about one centimeter. This fact should always be taken into consideration when making operations on the proximal surfaces of the teeth and enough separation made to compensate for this wear and to restore the interproximal space to its original size and the proximal surfaces to their original forms. Where an operation is made in a tooth on one side of the interproximal space *only* it is often necessary to exaggerate the restored surface and make what is called a plus contact so as to compensate for the wear that has occurred on both teeth and to hold the teeth apart with the one operation so far that the original width of the interproximal space is maintained. The amount of use and the substances chewed have a good deal to do with this interproximal wear, excessive wear being especially noticeable in chewers of plug tobacco.

The preservation of nearly normal interproximal space is of very great importance to the health of both hard and soft tissues. Its loss at first means thin attenuated gum septums followed by inflammation, absorption and pus. Proximal decays on the surfaces of the proximate teeth also occur, generally to the gingival of the contact wherever it may be; often penetrating the cementum and progressing rapidly toward the pulp without much external opening. To make the proximal surface of the tooth immune to caries under the gum septum, the gum must be healthy. To be healthy it must be in some bulk so that its summit is supported by a strong foundation of alveolar process and elastic tissue. A thick wide gum septum is tough, resistant and not easily injured. It is readily kept in a healthy condition, filling the interproximal space completely and preserving the proximal surfaces of the teeth from decay. With either a loss of interproximal space or a loss of contact this is impossible. A thin narrow gum septum is lacking in blood supply, has little strength or resistance, is easily injured and subject to inflammation and absorption. We often have a loss of contact, without a corresponding loss of interproximal space occasioned by the interlocking of the cusps and sulci of the teeth preventing them from moving together. This is even more serious than the loss of the space, as masses of fibrous food fill the spaces pressing on the gum septum, causing its absorption and allowing the inflammation to be communicated to the periodontal membrane. And

once this peridental membrane has been so injured as to cause a loss of any part of it, the gum septum will never reproduce; no matter with what care the contacts are restored or how perfect is the operation. We have noticed that as our patients advance in years there is a tendency for the gum septum to absorb and that the interproximal space is no longer filled to the contacts. While I think that a small part of this absorption is physiological, the greater part of it is traumatic, caused by either a loss of contact or by a loss of interproximal space. My own observation shows that patients 50 or 60 years of age who have had these matters carefully looked after still have their interproximal spaces well filled by a gum septum in a healthy condition. Where the contacts have been lost and food particles pass into the interproximal space, old fillings should be removed and new fillings made restoring the contacts. If the teeth have never decayed cavities should be cut in the sound teeth and fillings made that will insure the health of the soft tissues, for what would it avail if you save the amount of tooth structure necessary to make a filling, and lose the whole tooth from pyorrhea?

The teeth naturally move in three dimensions of space, upward, outward and forward. It seems to me that the third molars have an especially important function to perform in moving all of the teeth forward and holding the contacts tight as interproximal wear takes place. Their position in the jaw is especially favorable for this purpose, the long axis of the lower ones being inclined forward and their distal and apical portions are set in a firm plate of hard bone. Its face is also inclined forward, the distal cusps being higher than the mesial, giving us the well known Bonwill curve. In the closure of the jaw the lower third molar strikes the upper third molar on an incline plane, the distal cusps of the occlusal surface of the upper molar being lower than the mesial so that as the lower third molar moves forward it drives the upper third molar forward ahead of it, thus keeping the contacts tight on both jaws and compensating for the interproximal wear.

It is better to prevent the loss of interproximal space and contact points than to try and regain it once it is gone. Here an ounce of prevention is truly worth a pound of cure. For regular patients this is brought about by early repairs on the proximal surfaces with a material which will retain its integrity. Fillings of oxyphosphate of zinc or any other material which slowly disintegrates should never be left in

a cavity on a proximal surface for more than two or three months no matter what the age of the patient; and the practice of filling cavities in such proximal surfaces of the permanent teeth of children as involve the contact points with oxyphosphate of zinc cement cannot be too strongly condemned.

Frequent examination of regular patients is very much to be recommended and there should be no occasion for any serious loss of interproximal space for such people. It is those unfortunate people who have no regular dentist, or who have no regular habits of going to any dentist who suffer most. Large cavities which have been allowed to go uncared for, or which have been filled without thought of restoring anatomical conditions, are a misfortune and are deserving of our best endeavors. The patient once they understand what the result of your services will be, generally give you their hearty co-operation. A few do not appreciate the necessity and are unwilling to give the required time. The results following their ignorance are sufficient punishment for their lack of appreciation.

The preservation of interproximal contact is equally as important as the preservation of the space. For those unfortunate people who have lost one or more teeth the contacts on those remaining should be pushed up tight and bridges inserted to supply the lost teeth, which also act as a splint to hold the whole arch in its proper position and to keep the contacts tight. When making bridges as much care should be used to get tight contacts and good spaces for each end of the bridge as would be used were the restoration a filling. Many operators who are careful to restore interproximal spaces and contacts for fillings utterly fail to realize that it is equally important for crowns and bridges. A crown is seldom used on a tooth until it is very far gone and its proximal surfaces often having been filled two or three times, generally with a loss of space each time so that when a crown becomes necessary there is contact at the gingival on both proximal surfaces, a very deplorable condition and one that requires much ingenuity to correct, but which should invariably be corrected. A banded crown is always a source of irritation and when we have no interproximal spaces or contacts in addition, the condition is one that invites inflammation and absorption of all the tissues surrounding the tooth.

The restoration of lost space is often very difficult and sometimes makes such a disturbance of the other teeth that

the entire restoration is impractical. This is particularly true where there is a crowded condition of the front teeth and the restoration of space in the bicuspid or molars increase this already undesirable conditions. It is quite impossible to move the molars backward to any considerable degree and space restored is almost entirely by a forward movement. It is surprising how great this forward movement is if there is little resistance. On two different occasions I have closed a space of two and one-half or 3 mm. between the central incisors by making separations between the bicuspid and molars and building contacts. It requires the exercise of judgment in those cases where there is a loss of space in the bicuspid and molars and a crowded condition in the front teeth. The restoration of space in the back teeth increases the already bad position of the front teeth while a failure to restore space means a loss of efficiency in the back ones, so it is generally a question of choosing the lesser of two evils. Two of the most difficult places to restore lost space are where we have gingival contacts and the crown of the tooth is one-half or two-thirds gone, the repair necessitating a crown, and in those cases where the lower first molar has been extracted and the second molar tipped forward, bringing the distal root of the second molar practically parallel with the mesial root of the third molar. Any effort at separation resulting in a farther tipping over of the second molar and a restoration of interproximal space means the bodily moving forward of the roots of the second molar and a raising of the mesio-occlusal portion of the tooth by orthodontic methods, rather a difficult, but not impossible procedure. The restoration of lost space is ordinarily a simple matter, requiring time and patience more than anything else. Mechanical separators may be used to lift the teeth apart and gutta-percha packed in the cavity to retain the space. This is repeated at intervals of three or four days until the necessary space is gained. More rapid separation can be obtained by filling the cavity with gutta-percha or cement and tying cotton string dipped in paraffin tightly around the contact renewing every second day until the teeth are loosened. The separator is then applied, the necessary space made and the cavity packed with gutta-percha. It is seldom advisable to use rubber or other wedges placed in the interproximal space as they are very apt to crowd down upon the gum septum, forcing it out of place and often injuring the periodontal membrane so as to occasion its absorption. In the use of gutta-percha or tem-

porary stopping the same care should be used to keep the interproximal space clear and the gum free from pressure.

In making space where a porcelain crown is to be adjusted probably no better way can be used than to cut off the tooth even with the gum and fit in pieces of dry wood, which should be replaced every two or three days. The root of the tooth will prevent the wood from injuring the gum tissue and will form a base upon which the wood will rest. Where the space is only desired on one side a temporary crown may be set and used as a means of obtaining pressure. For gold crowns it is nearly always advisable to make a temporary band and fill it with cement, bringing the band and the cement even with the occlusion. The interproximal space is then gained by any desirable method on one side of the tooth, a cavity is cut in the cement, the band stretched over into contact with the proximating tooth and the cavity filled with gutta-percha. The opposite side treated in the same manner and the patient dismissed for two or three months to allow the teeth to adjust themselves to their new positions when the permanent operation may be made.

There are numerous ways that suggest themselves to the ingenious operator for application to individual cases. No matter what method is used, however, the greatest care should be taken that no injury occurs to the soft tissues, otherwise the purpose of the separation will be defeated. As long as the peridental membrane remains intact the gum septum will reproduce, but once the peridental membrane is destroyed the gum will never again fill the interproximal space to the contacts. The health and safety of these tissues should always be kept in mind when making any dental operation.

After the teeth have been moved into their true anatomical relation to one another, it is necessary to make an operation that will restore the true anatomical form of the tooth. Whether it be a crown or a filling of whatever material, not only should the axial surfaces of the tooth be given their correct contour but the occlusal surface as well. As we carefully study the forms of the different teeth in relation to the functions they have to perform we marvel at the efficiency of the machine. In its best type this appliance is perfect. It is too bad that man by wrong habits of living, lack of care, the transmission of disease and various other reasons has caused in so many cases a departure from the perfect type. In this ideal form every line, every cusp,

every groove, every swell and every depression has its use and purpose. When making an operation upon a tooth a failure to reproduce any of these essential things to a greater or less extent reduces the usefulness of the teeth. The contours on the buccal and lingual surfaces have their individual uses and should be carefully studied and restored. The proximal surfaces of each tooth differ in form from all of the other teeth in the same mouth and when making operations these peculiarities ought to be noted and reproduced in the finished operation; even the shape of the embrasures is important and should have consideration.

When making dental operations the two surfaces that are the most often neglected are the proximal surfaces and the occlusal surfaces. For several years our attention has been called to the importance of the restoration of the proximal surfaces and while there is now a general acceptance of the necessity for its accomplishment it is too infrequently done. The occlusal surface, however, has always been a neglected area. True, when making gold crowns and bridges we have made some effort to reproduce natural conditions, but when making filling operations, a flat occlusal surface has been deemed all that was necessary. Do you not suppose that if a flat surface made the most effective chewing arrangement the teeth would have been made in that form originally? If Mother Nature knew what she was doing when she designed our teeth, why not copy her efforts and reproduce as serviceable an organ as possible? This can be done with gold foil, amalgam, inlays, crowns or bridges. If a plaster impression is taken of a finished operation to restore lost tooth structure and a cast made from it, it seems to me that it is perhaps not a failure but a very incomplete restoration if one can tell where the operation has been made.

We have all of us admired a set of healthy teeth, free from dental repairs, as a whole, but did you ever take one tooth in your hand and study its lines and curves in their harmony and usefulness? Any well formed tooth is a thing of beauty as well as utility and will repay any study that one feels inclined to bestow upon it. If you wish to produce true tooth forms it is absolutely necessary to study individual teeth in all their details. It is natural in making a study of a tooth that you choose as perfect a type as is at hand. You will find that the study of this tooth will have had its influence on your operation. The imperfectly formed tooth is much more apt to decay than the perfect one. When

making your operations to restore these imperfect teeth the form of the tooth you have been studying will be constantly in your mind, causing you to improve the shape of the tooth operated on because you know what the shape of the tooth should be at its best. Your finished operation will have left the tooth and interproximal space in much better condition than they originally were.

Let me describe what to my mind constitutes an ideal condition between the upper first and second bicuspids: The interproximal space should be sufficiently wide to provide for a good healthy, firm and resistant gum septum that extends occlusally as far as the contacts. The proximal surface should conform in shape anatomically to that of the tooth. The effort not being necessarily to reproduce the shape of the tooth operated upon but that of an ideal tooth. The contacts are located slightly to the gingival of the occlusal surfaces and are well rounded and smooth like the surfaces of two marbles when brought together. When a ligature placed below them is held to the occlusal or buccal the sides of the ligature should not be more than one and a half or two mm. apart. The surfaces above the contacts are slightly curved as they approach the gingiva. You will also notice a longitudinal groove beginning at the occlusal plane of the gingival third and continuing to the bifurcation of the root. These curves and grooves are intended to make room for a thick gum septum and should be reproduced when possible.

The embrasures should open in nearly a straight line from the contact points to the axial angles so that when the food is separated by the contact points the cusps of the antagonizing tooth will force it freely down through the embrasure cleansing the proximal surfaces as it goes. In fact the embrasures should be sufficiently open to invite the passage of food through them. Particular attention should be paid to the marginal ridge and the grooves adjacent thereto. The marginal ridge should be strong and high above the contacts, and crossed by a very perceptible groove to its lingual. These marginal ridges and contacts divide the food under pressure and the groove gives a free entrance to the embrasure, making an effective self-cleansing machine. If this result is obtained no time nor skill expended has been too great for the reward achieved.

In conclusion I wish to leave with you this thought: We are not medical practitioners only, we are not artists only, we are not mechanics only. If we are real dentists, we are

a well balanced combination of all three. We are students, we are creators, we are designers, we are imitators. This seems to me gives us a sufficient opportunity for the exercise of our talents, no matter how great they may be. No profession has a better field, it only remains for us to dignify it by honest, earnest, thoughtful, conscientious effort.—*The Dental Review.*

Fibrous Foodstuffs and Certain Diseases.

THE truth and importance of the observations of Dr. J. Sim Wallace upon the value of the outer fibrous coats of cereal foodstuffs is born out by the following extract from a recent number of the *British Medical Journal*: "The old-fashioned millstones crushed the whole grain, but the steel rollers of the modern miller separate the outer coats. Recent researches have shown that beriberi and scurvy, possibly rickets, and perhaps pellagra, are due to the deficiency of certain substances in the food, minute in amount but essential to nutrition. Funk gave the name 'vitamines' to these substances, but their chemical nature is imperfectly known, and it is not certain whether the bodies all belong to the same chemical group. The substitution of polished rice for a disease characterized by peripheral neuritis and consequent paralysis. When the polishings are added to the diet, or the natural rice substituted for the polished, beriberi is cured. The vitamins in the cereals, including wheat, oats, maize, and barley, are contained exclusively in the outer coat. They are necessary for the growth and nutrition of the embryo as it develops into a seedling, and are placed in the outer coat no doubt because they can there best be utilized. As the modern miller, with his steel rollers, separates these outer coats, white bread contains no vitamins and cannot, with water, form an adequate diet. On the other hand, whole meal or black bread suffices.

"Vitamines are soluble in water, and alcoholic extracts may be prepared containing them. Such extracts added to polished rice or white flour make these foods far more sufficient, but they do not replace all that is in the whole berry.

Potatoes, carrots, fresh green vegetables, and fruits, lime juice, fresh milk, meat and yolk of eggs, contain vitamins. Thus those who can add these foods to white bread do not suffer. Yeast is especially rich in vitamins."—*British Dental Journal.*

Dr. W. D. Cowan, Regina.

DR. W. D. COWAN is a candidate for the Mayoralty in his home city of Regina. It has been suggested in the daily press that he will be unopposed, but be that as it may, the many dental friends of Dr. Cowan throughout the Dominion have every confidence in his ability to take care of himself through an election, and when elected, fill the Mayor's chair with honor and advantage to the city and great credit to himself. Good luck to you, Dr. Cowan.

Obituary—Dr. W. T. Stuart.

THE former students and friends of Dr. W. T. Stuart, Professor of Anatomy and Chemistry, Royal College of Dental Surgeons of Ontario, will be painfully grieved to learn of his sudden death on Saturday, 13th November, 1915, at his summer home, Oakville. The late Professor Stuart was associated with the late Dean Willmott in the organization of the School of Dentistry in Toronto forty years ago, and remained a member of the Faculty of the R. C. D. S. till the time of his death. Dr. Stuart will be lovingly remembered by the graduates of the R. C. D. S. for his kindly and genial disposition, and his great interest in all the student and College activities.

Obituary—Mr. Archie Stillwell.

THE late Mr. Archie Stillwell was born in the village of Newcastle, Ontario, in 1867. At the age of nineteen he accepted a position with S. B. Chandler & Son, the pioneer dental supply firm of Canada, who were just moving their business from Newcastle to Toronto. Shortly after the Canadian Pacific Railway Company opened its trans-continental line to Vancouver, Mr. Stillwell had the distinction of being the first dental traveller to cover Western Canada, which territory he covered for some years. In 1905 the S. B. Chandler Co. amalgamated with the New-Davis Dental Mfg. Co. and about a year later the company was taken over by the Temple-Pattison Co., Ltd., when Mr. Stillwell became associated with the latter firm. During the past nine years Mr. Stillwell has acted in the capacity of city representative.

The late Mr. Stillwell was respected by the dental profession and loved by his associates. The memory of his life will linger long as an inspiration to those who were closely associated with him.

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Complimentary Copies of Oral Health will be sent during the progress of the war to all those on active service whose army address is known.

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†Acting Chief Dental Surgeon, address, Ottawa.

*Lieutenants rank as Captains while overseas.

C.A.D.C. overseas address—Care Chief Dental Surgeon, Canadian Expeditionary Force, Folkestone, Eng.

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Harvey J. Burkhart, D.D.S., Batavia.
Director of the New Rochester Dental Dispensary.

THE photograph is that of Dr. Harvey J. Burkhart, Batavia, who has been persuaded to give up his private practice and act as Director of the Rochester Dental Dispensary. Dr. Burkhart is Mayor of Batavia, and will move to Rochester so soon as his present undertakings may be shifted to other shoulders. Congratulations, Doctor, and good wishes!

Canadian Army Dental Corps.

THE following twenty members of the C. A. D. C. are proceeding overseas about the 18th December, 1915: Major A. A. Smith, Capt. J. W. Bell, Capt. A. W. Winnett, Capt. J. E. Wright, Capt. C. F. Walt, Capt. E. A. Grant, Lieut. V. C. W. Marshall, Lieut. L. L. Matchett, Lieut. R. C. H. Staples, Lieut. W. A. Burns, Lieut. W. A. Sangster, Lieut. E. D. Madden, Lieut. E. McNeill, Lieut. H. C. Macdonald, Lieut. J. F. Morrison, Lieut. C. H. Bray, Lieut. E. J. Kelly, Lieut. E. S. Tait, Lieut. J. F. Shute, Lieut. B. P. McNally.

Major W. B. Clayton returned from overseas to relieve Major A. A. Smith, and has been appointed Acting Chief Dental Surgeon, Militia Headquarters, Ottawa.

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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. 5

TORONTO, DECEMBER, 1915

No. 12

EDITORIAL

The Housing of School Clinics.

THE recent professional conference on Oral Hygiene held in the city of Toronto was not only a most successful and interesting one, but we may venture to predict, may prove to be one that will be historic in the oral hygiene movement on this continent. The main subject under discussion by the conference was the proper housing of the public school clinics; in reality a discussion on the relative merits of the one large central clinic as against the many smaller clinics situated in the individual schools.

It is not our intention to discuss here the relative merits of these two propositions. The reader is advised to study for his own information the two articles published in this issue, which discuss most fully this subject from the two standpoints.

The oral hygiene movement in Toronto has progressed so far as to now bring the profession and the authorities face to face with this important question: Shall we have one central clinic, in which all the school children from the different parts of the city shall be brought for treatment? Or shall we have several smaller clinics established here and there throughout the city? Which system will prove the

more efficient, the more convenient and economical? We are at the parting of the ways, hence the recent conference on this subject.

After the whole matter had been earnestly and thoroughly discussed, two facts were clearly brought out. First, the preponderance of opinion was in favor of the clinics being housed in the school buildings in the different localities; and, second, it would seem wise that there be more concerted action between the United States and Canada on this important subject. This latter decision is deserving of serious consideration. Hitherto in the matter of establishing and conducting dental clinics, each large centre seems to have been a law unto itself. Boston is wedded to the central clinic—Toronto is on the opposite tack—Buffalo, Pittsburg and Chicago are each following their own bent, with the result that if all the systems were side by side they might easily be in the same class as Joseph's Biblical coat. This should not be. Why should not different states and provinces get together on this important matter and in such general conference map out a uniform course of action? We in Ontario are willing to share our ideals and plans with the others, and are just as anxious and willing to profit by theirs. This is a campaign upon which no state or province can afford to be neutral. Let us be real allies, moving as one body, working for the most efficient plan—the one that will help make of our boys and girls citizens of the highest type. If this idea grips you, think it over, talk about it, and work for it.

Dr. R. G. McLaughlin, Toronto.

IT is with a good deal of pleasure that we announce to the profession the addition of Dr. R. G. McLaughlin's name to the editorial staff of ORAL HEALTH. Dr. McLaughlin has been one of the leading spirits in Oral Hygiene work in the Province of Ontario for many years, and is at present Chairman of the Oral Hygiene Committee of the Ontario Dental Society. The editorial appearing in the present issue is from the pen of Dr. McLaughlin.

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